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VOL. I.—5TH YEAR SYDNEY: SATURDAY, APRIL 27, 1918. No. 17.

THE PRACTICE OF ANÆSTHETICS*

(A Condensed Lecture, from which the Physio-pathology of anæsthetics has been deleted.)

By **E. H. Embley, M.D.,**
Consulting Anaesthetist to the Melbourne Hospital

In anæsthetic practice there are three types of method in use—(1) General, (2) Local and Regional, (3) Spinal anæsthesia.

In general anæsthesia the entire body is rendered anæsthetic; in local and regional only segments and localities are rendered so, whilst by spinal anæsthesia only the legs and lower trunk can be anæsthetized.

Analgesia is a condition of more or less complete insensibility to pain without actual loss of consciousness, such as is attained by the hypodermic injection or the oral administration of narcotic drugs, the administration of alcohol, or by the use of minimal quantities of the agents used in the production of anæsthesia. As instances—the use of morphine and scopolamine in obstetric practice in effecting the so-called "twilight sleep," and of morphine and scopolamine hypodermically, and alcohol orally, for minor operations, such as curettage, etc.

General anæsthesia is attained by the inhalation of volatile agents, by the rectal injection of ether in oil, and by the intravenous infusion of ether or of other narcotic agents dissolved in normal saline solution.

In the following description it has been found more convenient, and certainly it is more correct, to describe anæsthesia as being a period or stage of the progressive narcosis induced by narcotic drugs. It is confusing and incorrect, for instance, to speak of the "paralytic stage of anæsthesia." The anæsthetic stage of narcosis begins when the patient is unconscious and insensitive to pain, and it ends with recovery of sensibility, or, on the other hand, in the paralytic stage of deepening narcosis.

The expression "pre-anæsthetic narcosis" is used to denote the preliminary use of morphine and scopolamine or atropine injected hypodermically about three-quarters to one hour before the administration of the inhalational anæsthetic agent.

The period during which the patient passes from the conscious to the unconscious and anæsthetic state is called the "induction"; that following, during which he is anæsthetic to all painful stimuli, is the period of maintenance, which terminates with the next period, that of recovery.

Preparation of the Patient.

Whenever possible the patient should be kept in bed for two or three days before that of the operation. A purgative is usually given on the evening but one before, and an enema the evening before when the operation is timed for the morning, or on the morning of the day of the operation when timed for the afternoon. Strong purgation should be avoided. The "bilious" patient may with advantage, from the point of view of post-operative vomiting, be purged a little more freely. To those liable to be sleepless a 0.3 to 0.5 grm. dose of barbitone may be given with much benefit on the night before the day of operation. Owing to the shortened period of anticipation, operations are more advantageously done in the morning than in the afternoon.

No food should be given within four to five hours of the time of operation, and no heavy meal allowed within at least 12 hours before. Fear inhibits digestion. Only clear soup or beef tea should be the latest meal. Children, however, should not be long deprived of food. A child should be given a small cup of liquid containing sugar or glucose, about two hours before the operation—the carbohydrate as a prophylactic against acidosis, especially when the anæsthetic agent is chloroform. Exhausted cases may also have a cup of soup or beef tea within two hours of the operation. Much exhausted cases bear operation better after having had an enema of half an ounce of whisky or brandy in warm saline solution given about half an hour before commencing the induction. Cases in severe pain suffer less shock if they be given morphine hypodermically to relieve the pain whilst awaiting operation.

In dental, and occasionally in other short operations, the patient is anæsthetized without being undressed. In such cases it is necessary that all tight bands should be released from around the waist and neck, and corsets should be removed.

Alcohol is not allowed before the administration of nitrous oxide; it shortens the period of anæsthesia. Tobacco smoking should not be permitted within 12 hours of the operation. The bladder should be emptied before the patient comes to the operating room. The patient's heat should be conserved, especially in the cold weather, by means of warm coverings. The temperature of the room should not be allowed to fall below 18.5° C.. The air for the patient's breathing should not be vitiated by the crowding of onlookers.

The anæsthetist should have at hand his mouth prop and gag, tongue forceps, pharyngeal tube, the mask, and the ether, chloroform and ethyl chloride.

Induction.

The induction demands most care and skill, that of chloroform narcosis being the period in which most fatalities occur.

The patient to be operated upon comes to the table in more or less intense fear, so that great effort has to be made to control the manifestations of it. It is not infrequent for an outburst of excitement to occur as the progress of narcosis impairs the will to control it. This is conscious and need not be confused with the struggling, which is

* This article was received for publication on October 19, 1917.

unconscious, in the later progress of the induction. Each variety of excitement subsides as induction proceeds.

This great strain upon the patient might be considerably lessened both by the nurse and the anæsthetist exercising gentleness and consideration in the management of the unfortunate patient through the ordeal.

Enquiries should be made as to previous experience in taking anæsthetics, and if any, whether all went well, and whether much vomiting followed, etc. Gaining the confidence of the patient can be greatly assisted if the anæsthetist makes a proper examination of the heart and lungs, even though the nurse's report as to the pulse-rate when the patient was quiet, is satisfactory; though the report also shows that respiration is of normal rate and is not much increased on exertion; though also there is no cough, and though the urine examination indicates normally functioning kidneys. It inspires confidence more than anything else. The patient should then be assured that he or she is in a perfectly fit state to take the anæsthetic. If there be suspicion of myocardial incompetence a rough test can be made on the table without exciting alarm by bidding him hold breath; if he cannot hold it for more than 40 seconds, myocardial incompetence or acidosis may be suspected. The greatest assistance, however, to the nervous patient is a good night's sleep and the injection for pre-anæsthetic narcosis. The anæsthetist should be assured that there are no tooth plates or foreign substances in the mouth, and that no food has been recently taken. Nervous patients are also better anæsthetized out of sight of the instruments and preparations. Assistance should always be at hand during the induction, in case of violent struggling.

That anæsthetic agent, for each case, should be chosen which affords the greatest prospect of safety to the patient and, at the same time, most convenience to the operator.

The position of the patient should be made as comfortable as possible. When ether is to be given without pre-narcosis the head should be well turned sideways as soon as muscular relaxation will admit it. This permits the escape of mucus and saliva from the mouth, and it helps to keep the tongue out of the pharynx. If the field of operation is near the head, the face should be turned in the opposite direction. This is not as necessary in cases pre-narcotized, owing to the inhibition of salivation by the pre-narcosis. The face is then placed so as to look more or less upwards and the chin held up, as is the practice in the use of chloroform. The tongue is then held out of the pharynx by the supported chin. The sitting posture is not safe for the narcosis of chloroform, but it is quite suitable for that of ether, ethyl chloride or nitrous oxide, as, for instance, in dental operations. The hanging head or the half supine postures are those usually chosen for operations upon the upper airway, as, for instance, in tonsillotomy, post-nasal growths, etc. In all such operations sponges or swabs on holders should be at hand, and only light anæsthesia employed, so as to preserve the coughing reflex with a view to the prevention of blood entering and blocking the larynx. In all operations on the chest the patient should be placed lying with the sound side uppermost. If, however, the apparatus for intra-tracheal administration is at hand, the posture is of less consequence. Musculo-spiral nerve paralysis often follows upon neglect, in permitting the arms to hang over the edge of the operating table. Brachial nerve paralysis has been known to follow after allowing the arms to hang down beside the head when the patient is in the Trendelenburg position.

Let no person press on the patient's chest during the induction when, for instance, he is being held by assistants during the struggling, or by nurses or assistants during maintenance. The freest airway should be aimed at both during induction and maintenance, for the greater safety of the patient and for the better respiratory intake of the anæsthetic agent whereby induction is more speedily and safely brought about.

Most commonly, in the induction, the reflexes are abolished and anæsthesia effected smoothly, without struggling or excitement. In some instances, however, especially in the employment of chloroform by the drop method, the anæsthesia is accompanied by much struggling or rigidity or incoherent talk, which sets in as consciousness is lost. At the same time and from the same cause the vagus and vasomotor nervous systems are abnormally excited, whilst the respiratory mechanism is first inhibited and then more or less excited to exalted activity. In most instances this arises from the administration of excessive concentrations of chloroform vapour. When 2% or less concentration is administered continuously, as by a percentage regulating apparatus, this exaltation of nerve excitability never happens. Although struggling in the administration of chloroform invariably means faulty administration and the courting of danger, it is pardonable when occurring in the alcoholic, the morphine taker, the excessive smoker, and in those who have been repeatedly anæsthetized on previous occasions. Such people have acquired some degree of tolerance and so need higher concentrations to secure induction in reasonable time.

Struggling may also occur in the induction by ether when, owing to some partial obstruction of the airway, a subconscious sense of smothering is created. Such a situation occurs in cases of nasal obstruction which the anæsthetist has not observed and is closing the mouth also, by holding the chin up. A mouth prop, of course, would have obviated it. This sense of smothering does not occur when nitrous oxide or ethyl chloride are used, by even the closed method, owing to the rapidity with which the induction is effected. The use of nitrous oxide or of ethyl chloride with ether sequence obviates also the breath-holding, struggling, muscular spasm, laryngeal crowing, coughing, etc., which are prone to occur from ether used alone in high concentration. The sensitiveness of the respiratory tract is so diminished by these substances that high concentrations of ether vapour can be freely inspired, the patient

passing smoothly from the narcosis of ethyl chloride or of nitrous oxide to that of ether.

Rigidity or struggling during induction always delays progress owing to the fixation of the thorax and the resulting arrest of or irregular breathing, lessening the intake of the anæsthetic agent. In the case of ether, delay is the only consequence; but in that of chloroform excessive intake upon restoration of the breathing, which then becomes considerably exaggerated, is a source of overdosage.

Struggling ceases as induction progresses, the reflexes and rigidity disappearing shortly afterwards, whereupon the stage of anæsthesia is entered. Occasionally rigidity does not relax with the onset of anæsthesia. A deeper narcosis is then necessary. This may be a result of defective innervation of the reflexes tested—the eye usually—as is common with children and young women. It also is common in cases wherein defective blood aeration is occurring, such as happens from nasal, lingual, laryngeal or other obstruction of the airway, or from defective pulmonary expansion from any of the various possible pathological causes. Partial nasal stenosis becomes more or less complete from the congestion occasioned by the ether. Dry and chapped lips arise from mouth breathing and suggest nasal stenosis. A mouth prop is of use to ensure free airway or the mouth must be held open by the hand of the administrator. Similarly faucial and lingual congestion will greatly diminish the lumen of the airway, especially in the short-necked variety of patient. For such cases the pharyngeal tube is of greatest value. Trickling of saliva into the larynx before the sensitiveness of the mucous membrane has been sufficiently diminished, may cause laryngeal spasm. This, when complete, is a formidable catastrophe. It occurs not infrequently in the incomplete form, and is then recognized as a crowing stertor, like croup. This degree of laryngeal spasm passes as the narcosis deepens, and need occasion no concern. But the complete spasm with absolute closure of the glottis and arrest of breathing only passes when the muscles relax with approaching death. Recovery ensues, however, even at this stage, if by artificial respiration air gains entrance before the heart ceases. It may be relieved sometimes by the finger, inserted through the mouth, forcibly lifting the epiglottis. The other resource is laryngotomy. The danger from this complication is not so great in the narcosis of ether as in that of chloroform.

Respiration may be arrested by the falling back of the tongue; by dentures, food or other foreign bodies blocking the pharynx; by foreign bodies as well as saliva entering the glottis, also by the irritation of the mucous membrane by the anæsthetic agent in cases of œdema of the glottis, causing spasm; by blood, pus or other fluid entering and blocking the bronchi, as in cases of internal rupture of hydatid cysts, abscess of the lung, empyema, etc., very rarely by spasm of the muscles of respiration of an epileptic character.

Owing to the possibility of occurrence of laryngeal spasm from the entry of saliva to the larynx it needs no emphasis in indicating the necessity of preventing it. It also indicates the risk of following with chloroform after ether when ether has occasioned salivation, during induction or maintenance.

Fat people become cyanotic more readily than others, Muscular rigidity invariably persists throughout N_2O and N_2O and O narcosis.

Maintenance of Anæsthesia.

The anæsthetic stage having been successfully induced, the concentration of the anæsthetic vapour administered must be reduced to avoid the danger of carrying the narcosis beyond the anæsthetic into the paralytic stage. A concentration of from 15 to 25% ether vapour is required to induce anæsthesia in average time, whereas from 6 to 10% concentration is sufficient for maintenance; that required for induction by chloroform is 2 to 3%, and for maintenance 1.5 to 0.5%. In the employment of ether the need to diminish the concentration when induction has been effected, is not so urgent as in that of chloroform, because the paralytic stage is less rapidly approached and therefore a deeper narcosis and more complete muscular relaxation may be attained with little or no danger.

By the competent anæsthetist the level of maintenance is not kept at a constant for all cases alike. A deeper level is employed, for instance, during dilation of the *sphincter ani* in the operation for removing piles, operations entailing much handling of the kidney, dragging on mesentery or other abdominal organs, removal of gall stones, etc. On the other hand, lighter levels are used for operations such as that for hernia, for plastic work and for most of the surgical procedures on the arms or legs, etc. This means that operations from which abundance of afferent impulses arise are apt to evoke embarrassing and even dangerous respiratory and circulatory reflexes. The deeper the level of the stage of anæsthesia the fewer will be the impulses reaching the central nervous mechanism. The airway must be maintained free; any fault in this is revealed by cyanosis, hence constant watch is necessary to detect the first signs. Constant watch must also be kept to detect the first indications of failing circulation in the oncoming pallor. This watchfulness is necessary, in addition to that needed to maintain the proper anæsthetic level. There is no room for loose methods. The anæsthetist who affords time to watch the operator not only endangers the life of the patient, but he must expect to acquire the ill opinion of his friends, especially the surgeon.

Recovery.

This commences when administration ceases, and may begin, in the case of ether anæsthesia with prenarcosis, after prolonged administration, even as long as ten minutes before the operation ceases. With chloroform anæsthesia, however, administration is continued until operation is completed. The time occupied in recovery to consciousness necessarily varies with the duration of the administration, and the level of the stage of narcosis at the time when it ceased. Recovery after the narcosis of nitrous oxide or nitrous oxide and oxygen is the most rapid of all; even when the operation has occupied two or three hours recovery is accomplished

in as many minutes. If ether be used to supplement the nitrous oxide and oxygen anæsthesia, recovery is delayed in proportion to the amount of ether used. Recovery from ethyl chloride narcosis is less rapid than that of nitrous oxide, and it is longer as the administration is prolonged.

Recovery from ether narcosis is attended at first by a drop in the rate of respiration and by a loss of colour from the face. The corneal and the pupil reflexes return and the pupils contract. Morphine delays recovery both by virtue of the sleep which follows and the less efficient respiratory exchange. Good breathing favours rapid recovery. In the case of the diabetic, recovery may be prolonged by acidosis and may be replaced by coma.

(To be Continued.)

APPLIED COMPARATIVE ANATOMY.

Being an Address Delivered Before the Medical Students University of California, at Berkeley, California, on January 18, 1918.

By **W. Colin MacKenzie, M.D.,**

Melbourne; Member of the Council of the Anatomical Society of Great Britain and Ireland.

The study of human anatomy may be approached from one of two ways, *viz.*, the structural and the functional. The student who applies himself to learn the anatomy of the structures of the body without reference to ancestral history and function, will regard the subject as boredom, a necessity for examination purposes, but soon to be forgotten. The student, on the other hand, who approaches anatomy from the functional side, who, *e.g.*, is not merely willing to learn the site of Lane's, Treitz's and other folds, but their functional significance and ancestral history, will be brought truly in contact with the most interesting and important field of his medical work. He will realize with Charles Bell that human anatomy is a part only of a more general science, which embraces the knowledge of the structure of all classes of animals, from the most simple to the highest forms; it cannot be highly cultivated without the assistance of comparative anatomy. The functional method was that pursued by Haller, Charles Bell, and the greatest master of all, John Hunter. It was unfortunate that the study of structural anatomy received a great impetus with the advent of Listerism, since a powerful weapon was placed in the hands of men who were apt to think that cleanliness and a superficial knowledge of the human frame were sufficient for surgical success. Owen's hostile attitude to the works of Spencer and Darwin was another contributing factor. Within recent times, and especially owing to improved clinical methods, and the influence of the London Schools of Anatomy, notably of Professors Arthur Keith and Wood Jones, there has been a reversion to the functional as against the structural method. We recognize that the surface anatomy of a bone is secondary in importance to the action of a muscle to which it gives attachment, and for which it exists. Furthermore, we recognize that it is impossible for a student to learn the action of muscle either from an anatomical text-book, or in the dissecting room. Properly directed, the student can learn more in an hour about the action of muscles from a case of paralysis than from weeks spent on the cadaver or from anatomy books. This afternoon I propose to draw your attention to some of the researches carried out on the fauna peculiar to the Australian continent, and their bearing on problems connected with the human body.

The Large Intestine.

In recent years a great impetus has been given to the study of the large intestine, the result, largely, of researches on motor mechanism by Starling, Bayliss and Arthur Keith in London, Cannon of Harvard, and Alvarez, of this city. Functional studies have necessitated a review of the gross anatomy of the large gut, which, for purposes of study, is described as consisting of caecum, ascending colon, hepatic flexure, transverse colon, splenic flexure, descending colon and sigmoid colon, which consists of iliac and pelvic colons. The rectum proper commences opposite the third sacrum, and originates from the cloaca, a highly differentiated part of the hind gut. This classification of the large intestine into eight divisions is dependent on the structural relationship of these parts, dependent in turn on dorsal fixation associated with the erect position. Let us see what light can be thrown on this complex description by a reference to comparative anatomy and especially to that of the Australian fauna. If we take two animals from the same order (*marsupialia*), *viz.*, the koala and the Tasmanian devil, we are struck by the fact that we have here two extremes of colon development. The intestinal tract of the koala (Fig. I.) is characterised by great development of colon which is held in relation to the pyloric and commencing duodenal region by a tough fibrous membrane—the mesial fold—measuring 1.5 cm. long and 1 cm. broad. By means of this band we distinguished a left distal colon 210 cm. long, swung freely on its own mesocolon (inferior mesenteric), which is attached along the dorsal abdominal wall, and a right or proximal colon 150 cm. long, which

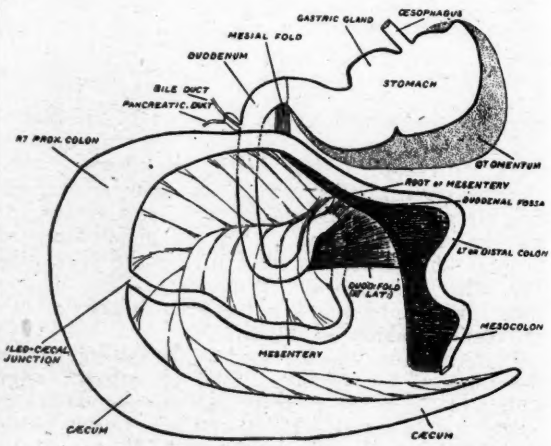

Fig. I. The Gastro-Intestinal Tract of the Australian Koala.

is swung together with the caecum and small intestine on the common mesentery (superior mesenteric). The caecum of koala represents the greatest instance of caecal development in the *mammalia*, and may reach 240 cm. long. In the Tasmanian devil, on the other hand (Fig. II.), the intestinal tract is reptilian in character, consisting of a canal 157 cm. long from pylorus to pelvis and swung apparently on a single mesentery 7 cm. long at its dorsal attachment This latter consists of two portions, an upper, 1.5 cm. long (superior mesenteric), corresponding to the duodenum and small gut (135 cm. long), and a lower, 5.5 cm. long, representing the original mesocolon (inferior mesenteric), and corresponding to the remaining 22 cm. of intestine, which is large gut. At the junction of the colon and small intestine a well defined branch of the right vagus is present. There is no mesial fold bringing the colon into relation with the pyloric region, the minimum interval in an adult being about 18 cm. There is no development of colon on the mesentery corresponding to the right proximal colon of koala. The 22 cm. of large intestine present corresponds to the left distal colon of koala. From the selection point of view I regard the mesial fold as of prime importance in colon development. Its evolution can be best studied in chameleon (*reptilia*), bat (*cheiroptera*), and kangaroo (*marsupialia*). Throughout the *mammalia* the proximity of colon to pyloric region is associated with development of proximal colon, the part situated on the common mesentery and simillarly, absence of this proximity and of the mesial support is associated with non-development of the right or proximal colon. The right, proximal, or mesenteric colon can be regarded as a new or experimental colon. Here we find large and small caeca, appendices, coils and loops. The somewhat complicated right colon of rodents is simplified in *lemuroidea* and the human type appears in the platyrrhine monkeys. From a successive study of monkeys and apes—*lemuroidea, platyrrhina, catarrhina* and great anthropoids—it is interesting to note that fixation of the right colon, *i.e.*, shortening and dorsal fixation of its portion of the common mesentery takes place from above downwards, *i.e.*, begins at the mesial attachment. Experiments in this direction amongst the *mammalia* can be studied in wombat and kangaroo. From the mesial fold also begins the attachment of the left or distal colon and mesocolon (human "transverse" colon) to the great omentum, which extends in higher mammals to the spleen. This, however, it must be remembered, is preceded by fixation of the colon in the splenic region. The great omentum whose development is associated with that of the spleen, as shown in platypus, is at first free from colon. The erect posture necessitates secondary fixation of the colon, between the pylorus and the spleen, The intestine and its mesocolon become included, drawn up as it were, by the great omentum, and grades of this can be studied in kangaroo (Fig. III.), in which we find peritoneal bands or seekers passing from the omentum to the distal colon, platyrrhine and catarrhine monkeys, and great authropoids. To understand the anatomy of the human acquired "lesser sac," a knowledge of the peritoneum of the Australian fauna is essential. The first attachment

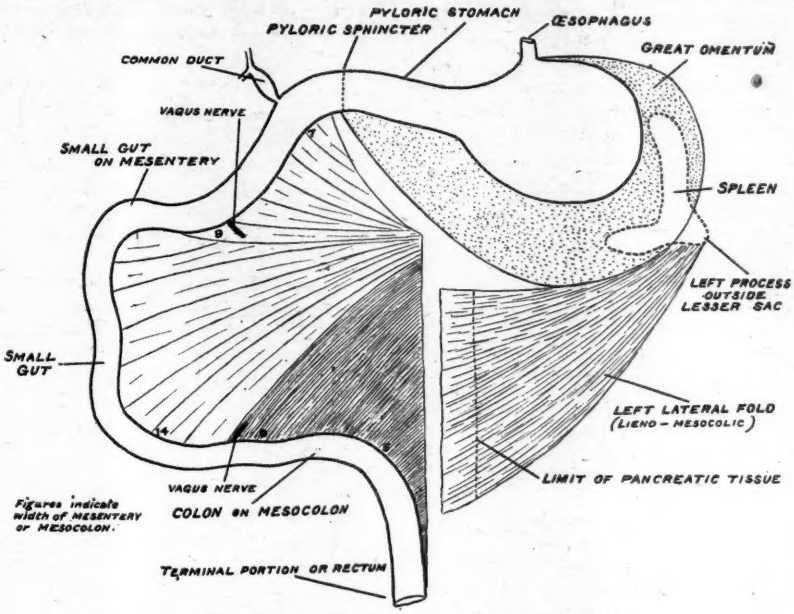

Fig. II. The Gastro-Intestinal Tract of Tasmanian Devil.

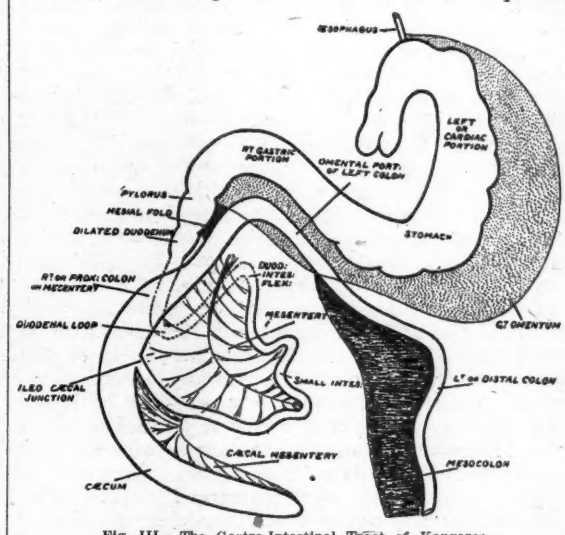

Fig. III. The Gastro-Intestinal Tract of Kangaroo.

of the colon distal to the pylorus, however, is in the splenic region. This depends on the presence of a fold, which I have termed the left lateral or lieno-mesocolic. This fold can be best studied in the platypus. On opening the abdomen of this monotreme concomitant with the presence of a complete diaphragm and great omentum, one is struck by the large development of spleen and pancreatic tissue. The spleen is somewhat V-shaped (Fig. IV.), and three

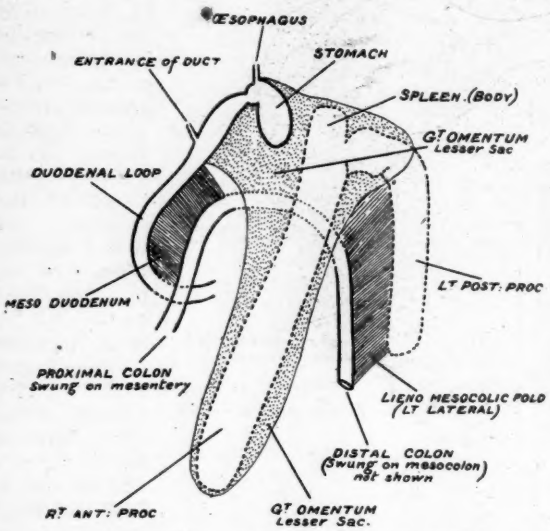

Fig. IV. The Spleen and Left Lateral Fold in Platypus.

portions are recognized, *viz.*, a small body, about 3 c.cm. long, directed towards the œsophagus and suspended on the great omentum, a large right ventral process, 12 to 15 cm. long, also suspended on the great omentum, and a shorter left dorsal process outside the lesser sac, about 8 cm. long, which is in relation with a fold—the left lateral—connecting it to the mesocolon of the left or distal colon. A diffusion of pancreatic tissue is found in relation with the left lateral fold. This fold, with the left splenic process and pancreas, can in the platypus be lifted free from the ventrum of the left kidney and the dorsal abdominal wall. As evolution proceeds, the upper part of the great omentum (gastro-splenic) shortens, inclining the spleen dorsally. The pancreas, conforming to the abdominal law of dorsal fixation of solids, also approaches the dorsal wall, and the result is shortening of the left lateral fold and its attachment to the kidney (lieno-renal fold), first to the lower and then to the upper pole. Thus we have proximal the spleen, pancreas, colon, left kidney and adrenal, and the successive grades of this may be studied in platypus, Australian opossum, wombat, catarrhine monkeys and great anthropoids up to man. Secondary fixation of the "descending" colon begins at the splenic fixation and extends downwards. Secondary fixation of the colon between the pylorus and spleen begins, as stated, at the pyloric region (mesial fold), and spreads towards the spleen.

A convenient division of the large intestine (Fig. V.) then would be into two parts.

(*a*) From the ileo-caecal region to the pyloric region—a point practically corresponding to the entrance of direct vagal branches—would be right, proximal, or mesenteric colon. This includes caecum, ascending colon, and hepatic flexure, and can be regarded as experimental colon.

(*b*) Colon distal to the pyloric region and extending to the mid-sacrum of the pelvis would be left,

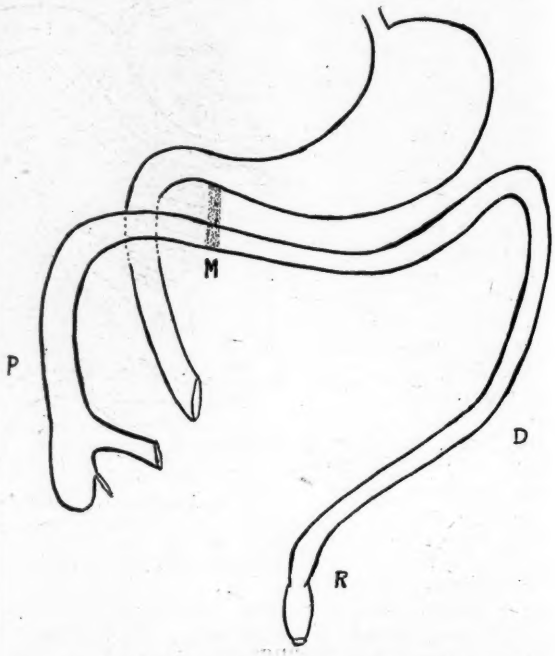

Fig. V. A simple division of the Human Large Intestine.

M. Pyloric relationship defining Proximal from Distal Colon.
P. Right, proximal, or experimental Colon.
D. Distal, or Mesocolic Colon.
R. Recto-Colic junction.

distal, or mesocolic colon. This is the original primitive colon, and includes the portion known in man as transverse colon, splenic flexure, descending colon, iliac colon and pelvic colon. This classification is one based not only on comparative anatomy, but also on pathology. I have seen chronic thickening and dilation of the left colon ending almost abruptly at the pyloric relationship (mesial fold), which corresponds in the human body to a point just below the middle of a line drawn from the proximal end of the sternum to the *symphysis pubis*. In a series of 42 resections of the large intestine for diverticulosis by that eminent surgeon, William Mayo, of Rochester, the left or distal colon was affected in 37 cases and the right, proximal colon in only two. Of these 37, no less than 36 were affections of the "sigmoid" region. Furthermore, according to the statistics of the Mayo Clinic, the "sigmoid" is a favourite site of single polypi and localized papillomatous growths. We must also remember the association of Hirschsprung's disease with the left distal colon, and especially the sigmoid region. One might infer that the "sigmoid" is a portion of the large intestine with a diminished

resistance. The lower part of the "descending" colon and "sigmoid" represent a portion of the colon that for some reason, perhaps dietetic, perhaps owing to defective motor mechanism, has failed to become fixed dorsally in spite of the apparent demand of the erect posture.

The Liver.

If we take the platypus at one end of the mammalian scale and man at the other, a striking feature of the liver is the multiplicity of lobes (diffusibility of hepatic tissue) in the former and compactness or tendency to unification in that of the latter.

This we find true not only as regards the liver, but also as regards the spleen and pancreas. For the erect attitude consolidation would be advantageous for fixation, and so amongst other things the tendency to torsion lessened. Occasionally, human livers are met with presenting curious fissurings and lobulations, which are classified as abnormalities, but the significance of which is explained by a study of Australian mammals. In what may be regarded as a typical mammalian liver a primary division into five lobes may be recognized, namely, the mesial or cystic, lodging the gall bladder, which is separated on either side from the right lateral lobe and left lateral lobe by the right and left lateral fissures, and on the visceral surface of the right lateral lobe, as is well shown in platypus in platypus (Fig. VI.) we have projecting the *lobus spigelii* and dextrally the larger free caudate lobe. The spigelian lobe reaches its maximum development in the kangaroo, where it dips down within the lesser sac in the interval between the right and left portions of the great stomach, being grooved for the passage of a large abdominal œsophagus, 10 to 12 cm. in length. The caudate lobe, on the other hand, though well defined in platypus, and especially in echidna, may be regarded as non-existent in kangaroo and wombat. In the echidna it is seen to be largely an accommodation effect for the upper pole of the right kidney and adrenal. With comparative fixation of duodenum and panereas and unification of the organ, a more limited relation of kidney to liver is seen, with disappearance of the right lateral fissure. Amongst the members of the Australian fauna, the gall bladder forms a separation of the mesial or cystic lobe into two primary divisions: the right and left cystic lobes; and in the wombat, koala, opossum and bandicoot, a definite separation of the left division into two portions by means of a fissure, the mesial or cystic fissure has taken place, so that three portions of the mesial lobe are recognized *viz.*, right mesial, intermediate mesial, and left mesial. The suspensory ligament is noted in relation with the mesial fissure, between the intermediate and the left mesial lobes, and not with the left lateral fissure, between the left mesial and the left lateral lobes. The conveyance of maternal blood to the liver, along the suspensory ligament, would be a factor favouring the retention of the mesial fissure, as compared with the left lateral fissure. The human longitudinal fissure corresponds to the mesial or cystic fissure, as is well shown in a study of gorilla and wombat (Fig. VII.), and the inter-

Fig. VI. The multilobed Liver of Platypus.

ST. Stomach.
V. Inf. Vena Cava.
K. Kidney.
A. Adrenal.
E. Pylorus.
L. Left Lateral Lobe.
R. Right Lateral Lobe.
C. Caudate Lobe.
S. Spigelian Lobe.
R.M. Right Mesial or Cystic Lobe.
L.M. Left Mesial or Cystic Lobe.
D. Diaphragm.

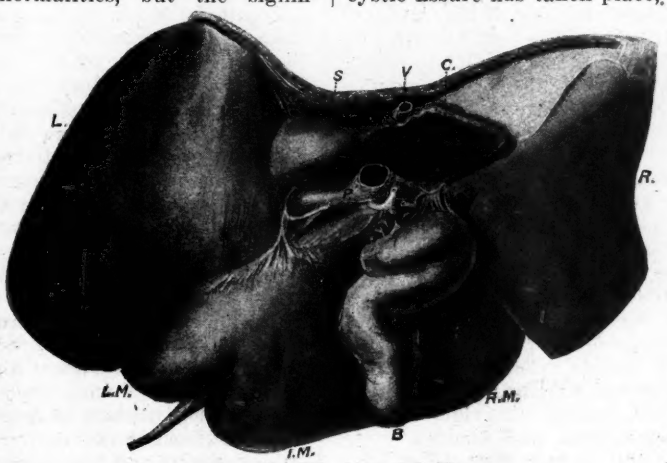

Fig. VII. Liver of Gorilla.

L. Left Lateral Lobe.
R. Right Lateral Lobe.
B. Gall Bladder.
R.M. Right Mesial or Cystic Lobe.
I.M. Intermediate Cystic Lobe.
L.M. Left Cystic Lobe.
P. Portal Vein.
V. Vena Cava.
C. Caudate Lobe.
S. Spigelian Lobe.

mediate mesial lobe, *i.e.*, between the gall bladder and the mesial fissure, is represented in the human liver by the *lobus quadratus*. In the wombat, in which animal great diversity of liver shape is met with from the primitive multilobed type to one scarcely distinguishable from the human, irregularities can be studied in connexion with this lobe, giving us an indication of its instability (Fig. VIII.). It would further appear that cases of atrophy of the human *lobus quadratus* often met with represent the trend of Nature's evolution towards further unification and simplification of the organ, a fact to be remembered in cases of so-called "displacements of the gall bladder." This is the experimental region of the liver, and there is no reason why the gall bladder fissure in the human liver should not serve for the conveyance of the maternal blood to the portal fissure and *vena cava*, especially when we consider the proximity of portal vein and bile duct to the inferior *vena cava* in kangaroo. In William Flower's classification of the lobes of the liver, followed generally by biologists, the longitudinal fissure is taken as the line of separation of the right from the left side. The left human lobe, however, really consists of the original left lateral lobe, together with the left mesial lobe, the original left lateral fissure having disappeared. The ideal division would be one applicable to all the mammalia and Flower's arrangement is not even applicable to all members of such closely-allied orders as monotremes and marsupials. It could not apply to the monotremes, kangaroo, Tasmanian devil, and some varieties of wombat, nor would it hold for the liver of the gorilla in which the mesial or cystic fissure (human, longitudinal) is diminutive compared with the left lateral fissure. The division is best dominated by the arrangement of the vascular and biliary systems. In a minute examination of livers belonging to monotremes and marsupials, I found that they conformed to a single plan, *viz.*, right and left portions, with the portal vein, gall bladder, cystic and common ducts, as the common stem (Fig. IX.). On the right side of the stem, cystic and venous branches were traceable to the right lateral and right mesial lobes and on the left side to the left lateral and intermediate mesial and left mesial lobes. The true line for the division of the liver into right and left portions would be from the fundus of the gall bladder through the portal fissure to the dorsal border, as originally defined by James Cantlie. Apart from comparative anatomy, this division is supported by pathological findings. We can inject separately into one or other side of the human liver. Newlands, the distinguished Adelaide surgeon, has told me that he has seen hydatid involvement of the right side of the liver, with compensating enlargement of the left, and Cantlie observed this in connexion with atrophy of the right side following chronic abscess, in which the liver was almost of normal weight. This conception of the liver offers up a new and interesting field in connexion with the distribution and treatment of cancer, hydatid and sepsis.

Fig. VIII. Liver from Victorian Wombat resembling human type.
V. Vena Cava. R.M. Right Mesial or Cystic Lobe.
L. Left Lat. Lobe. L.M. Left Mesial Lobe.
P. Portal Vein. B. Gall Bladder.
R. Right Lat. Lobe.
L.M. is the original Intermediate Cystic Lobe—the original Left Mesial or Cystic Lobe becoming part of the Left Lateral Lobe with almost complete disappearance of the Left Lateral Fissure.

From a study of comparative anatomy, we see how the human liver and spleen acquire their shape. The question naturally arises: if the liver cells perform multiple functions are the functional activities different in different portions of the organ? This would be best studied in the more primitive multilobed livers, like those of the marsupials and monotremes. And, similarly, in connexion with the spleen, for it must be remembered that human spleens are often met with in which the body and right and left processes are all separately defined. We await the further investigations of your distinguished Professor, Herbert Evans, on the action of vital stains, possibly to throw light on this subject. To know the sequence of acquisition of function of liver cells is essential to a proper classification of diseases of the organ, for loss of one or more, not necessarily all, the functions of a cell must be surely as characteristic of hepatic disease as it is in connexion with loss of function of a muscle.

The Diaphragm.

For a proper knowledge of the respiratory mechanism a knowledge of the ancestral history of the diaphragm is essential. Why was the diaphragm called in to being, so as "to act as a piston in the respiratory bellows of the human body." Gross comparative anatomy does not help us much, since the intermediate stages between *amphibia*, where some light is thrown on its origin, and *mammalia*, in which it is found fully formed, are for the most part missing. It is found as complete in the "lowest" mammal, the platypus, as in the "highest," man. Recourse must be had to a study of the comparative embryology of the *mammalia*. Embryological studies in man have not helped us much, since, owing to man's age and the numerous adaptations, these do not reveal a connected picture of his evolution. Reference must be

made to a lower form, and there is little doubt that embryological studies of the platypus would give us a complete picture of the evolution of the diaphragm and its correlations. This, perhaps the most important work in the whole realm of biology, still remains to be carried out.

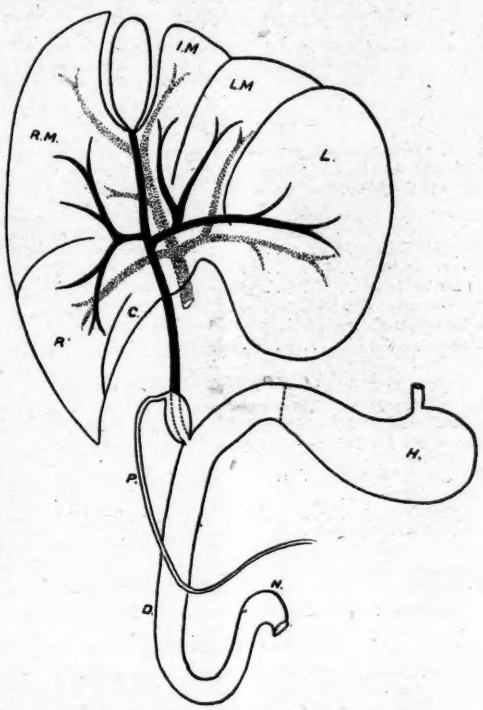

Fig. IX. The Portal and Bilary System in Koala.
H. Stomach.
P. Pancreatic Duct showing reservoir at termination.
D. Duodenum.
N. Duodeno-Intestinal Flexure.

Inguinal Hernia.

One would scarcely expect that comparative anatomy would throw light on the treatment of inguinal hernia. In the island of Tasmania is found a carnivorous marsupial, the Tasmanian devil (*Dasyurus sarcophilus*), which is not found on the mainland of Australia. Unprotected, like the koala and kangaroo, and with everyone's hand against it, this important mammal has been driven into almost inaccessible parts of the island, and will soon be extinct. I have already drawn attention to its highly specialized intestinal tract. It has, in addition, many other remarkable biological features of importance in the study of man's physiology. In the monotremes, the testes are intra-abdominal in the adult, although there is a more definite effort towards the extra-abdominal stage in echidna, than in platypus. To John Hunter we owe, of course, the true description of the mechanism of descent. Why the descent is necessary we scarcely know.

In the marsupials the testes are extra-abdominal, but contained in a prepenial scrotum. In the wombat, koala and kangaroo, Nature has not troubled to close the canal of communication between the abdominal cavity and the *tunica vaginalis*, the internal abdominal ring is patent. Yet, although there is abundant laxity of abdominal content, no one has recorded an instance of intestinal descent into the canal in the saltatorial kangaroo. In these three marsupials the intestinal, urinary, and genital canals all terminate within a common external outlet, so that they are practically monotrematous; but in the Tasmanian devil a great advance as regards both the male and female external genitalia has been made towards the higher mammalian type. The interesting feature is that correlated with this advance, the internal abdominal ring is no longer patent, and the canal of communication between *tunica* and abdominal cavity has disappeared. Nature has cured the hernia.

Here is presented to us an interesting field for study as regards correlations and motor mechanism in the closure of the internal abdominal ring.

The Action of the Biceps Brachii.

Flexion of the elbow is associated so much in our mind with biceps contraction that the statement that the biceps is not a flexor but only a supinator will come as a surprise. Nevertheless, this is so. The biceps, as a supinator, must be relaxed and elongated in the position of over-pronation. Yet, with the hand over-pronated, we can readily flex the elbow. That function is performed by the more powerful brachialis, which alone calls into relaxation the powerful triceps. If we examine the marsupial forearm, *e.g.*, koala, we find the biceps has a double insertion, one portion with the radius and the other with the ulna. In man, the ulnar insertion is not present. The insertion is to a bone (radius) capable of performing the rotatory movements of pronation and supination. The bicipital fascia I regard in the light of an annular ligament, serving to hold down the biceps tendon and to prevent it from injury. This conception of biceps function is important in connexion with brachial injuries in which failure to supinate is a frequent sequel. Flexion of the elbow to rest the biceps is unscientific. The arm should be abducted for the long head, and the hand should be over-supinated, to prevent action of the antagnostic pronators, which are in this position relaxed and elongated.

Examples like the preceding, drawn from comparative anatomy, and having direct application to man, might be multiplied many fold. These, however, are quite sufficient, I hope, to show that anatomy should be the guiding dominant factor throughout your future medical life. It should not be regarded merely as something to be learned up for purposes of examination and subsequently forgotten. A superior knowledge of applied comparative anatomy is the great dividing line between the empirical and the scientific surgeon. If the practice of medicine is ever to become truly scientific, it can only be on a foundation of comparative anatomy, not only structural but functional as well.

Reviews.

PRACTICAL GYNÆCOLOGY.

Dr. Horne is to be congratulated on bringing out a second edition of his handy little work on "Practical Gynæcology."[1] Although containing only 316 pages, it covers the whole

[1] Practical Gynæcology, a Manual for Students and General Practitioners, by George Horne, M.D., Ch.B.; Second Edition, revised and enlarged; 1917. Melbourne: James Little. Demy 8vo., pp. 331, illustrated. Price, 21s.

field of practical gynæcology. The book does not pretend to be one of the exhaustive text-books dealing with this subject. It is a concise and clear presentation of what the general practitioner and student ought to know in regard to gynæcology. Of course in a work of this size the various theories regarding the causation and treatment of prolapse and retro-displacements of the uterus cannot be fully dealt with, but the pelvic floor and its anatomy, as well as tubal-pregnancy have hardly received the attention their importance deserves. It may be called a handy volume not overburdened with a few statements, but containing a large amount of information well boiled down. Most text-books on this subject are too elaborate, and contain too much padding for the ordinary practitioner or student.

The first chapter clearly points out the importance of a careful history and examinations in each case, and fully enumerates the various important points, which ought to be brought out so as to enable the practitioner to arrive at a correct diagnosis. It is pleasing to see that the author does not hesitate to say that the uterine sound is a dangerous weapon except in the hands of an expert. At one time it used to be the routine practice to pass a sound into the uterus of every woman who complained of any pelvic trouble, very often with disastrous results.

It is to be regretted that the author recommends the somewhat antiquated and dangerous practice of securing the blood supply in hysterectomy by passing an aneurysm needle round the vessel, armed with catgut. In any gross disease of the uterus, such as fibromyomata, the veins are much enlarged and thin-walled; the needle passed round the vessel is very liable to prick these enlarged veins and cause considerable delay and inconvenience, if not danger. Surely it is much safer and better to double-clip each vessel, to cut between the clips and to tie on the proximal clip as it is released. In this way a groove is formed into which the ligature fits, and the coats of the vessel are crushed, so that slipping off of the ligature, if properly tied, is almost impossible. If a vessel be tied without clipping it first, the rebound of the blood may loosen the knot and cause it to slip. It is also a mistake to cut these ligatures long and use them as tractors, as they are very likely to pull off unless introduced as a suture, and some of the structures around the vessel taken in with it.

The author has the honour of being one of the few Australian writers to publish a work on practical gynæcology, and his work compares favourably with some of the recent works on the subject. Most operators and lecturers depend on American works for reference on this subject. It is a strange fact, but none the less true, that none of the British writers of late years have published a work on gynæcology of the same high standard as the older works by Lawson Taft, Bland Sutton and Allbutt and Playfair.

LEGAL EVIDENCE OF REGISTRATION.

Medical practitioners will be well advised to bear in mind that, according to the provisions of the *Medical Act* of Victoria, only a registered medical practitioner can recover in a court of law fees for medical attendance. It is therefore necessary for a practitioner suing to produce a copy of the Medical Register as evidence of registration. Dr. E. Spring, of Moonee Ponds, failed to produce this evidence in a case in which he claimed £13 13s for professional attendance on a patient. The fact that he had not proved his registration in court in presenting his case was commented on Mr. Barnett, who was appearing for the defendant, after the complainant's case had been closed. The Bench had no choice but to uphold the objection and to dismiss the case without costs.

Public Health.

NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending April 13, 1918:—

	Metropolitan Combined District. Cs.	Dths.	Hunter River Combined District. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	13	0	8	0	7	1	28	1
Scarlatina	20	0	1	0	14	0	35	0
Diphtheria	103	4	15	0	50	3	168	7
*Pul. Tuberculosis	21	13	1	0	0	0	22	13
C'bro-Sp'l Menin.	0	0	0	0	1	0	1	0
Poliomyelitis	0	0	1	0	2	0	3	0

* Notifiable only in the Metropolitan and Hunter River Districts, and, since October 2, 1916, in the Blue Mountain Shire and Katoomba Municipality.

VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending April 14, 1918:—

	Metropolitan. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	2	0	5	1	7	1
Scarlatina	21	0	24	0	45	0
Diphtheria	63	0	45	3	108	3
Pulmonary Tuberculosis	13	7	12	5	25	12
C'bro-Spinal Meningitis	0	—	1	—	1	—
Poliomyelitis	5	—	5	—	10	—

QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending April 13, 1918:—

Disease.	No. of Cases.
Enteric Fever	16
Scarlatina	9
*Diphtheria	42
Pulmonary Tuberculosis	9
Cerebro-spinal Meningitis	10
Poliomyelitis	1
Erysipelas	2

*One case returned a membranous croup.

SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, Adelaide, during the week ending April 6, 1918:—

	Adelaide. Cs.	Dths.	State. Cs.	Dths.	Totals. Cs.	Dths.
Enteric Fever	1	0	12	0	13	0
Scarlatina	0	0	12	0	12	0
Diphtheria	2	0	38	0	40	0
Pulmonary Tuberculosis	0	3	9	1	9	4
Cerebro-Spinal Menin.	0	0	2	0	2	0
Erysipelas	3	1	0	0	3	1
Morbilli	0	0	1	0	1	0
Favus	0	0	1	0	1	0

WESTERN AUSTRALIA.

The following notifications have been received by the Department of Public Health, Western Australiafi during the fortnight ending March 30, 1918:—

	Metropolitan. Cases.	Rest of State. Cases.	Totals. Cases.
Enteric Fever	8	8	16
Scarlatina	31	1	32
Diphtheria	42	22	64
Pulmonary Tuberculosis	12	1	13
Cerebro-spinal Meningitis	2	0	2
Erysipelas	4	1	5
Septicæmia	1	0	0

TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the week ending April 13, 1918:—

Disease.	Hobart. Cases.	Launceston. Cases.	Country. Cases.	Whole State. Cases.
Enteric Fever	0	0	6	6
Scarlatina	0	0	3	3
Diphtheria	0	7	14	21
Pulmonary Tuberculosis	2	2	4	8
Cerebro-spinal Menin.	0	0	1	1
Poliomyelitis	1	0	0	1
Puerperal Fever	0	2	0	2

The Medical Journal of Australia.

SATURDAY, APRIL 27, 1918.

Efficiency.

At the other side of the world our Empire stands in gravest peril. We have been told that in point of numbers our troops, together with the troops of our allies, have a slight advantage over the enemy. Events chronicled in the daily press within the past few weeks indicate that those who have characterized the enemy as demoralized as a military machine, exhausted and practically beaten, have made a great miscalculation. The struggle, terrible in its destructive force, has proceeded in his favour. We are compelled to fight militarism with militarism, and at this stage of the long drawn out combat, we are losing ground. We are learning that the German menace cannot be broken by economic pressure. Germany has safeguarded herself too well and has so organized her resources that she can go on, frugally and enduring hardships, no doubt, and that her defeat will not be secured in this way. We have learned, in spite of many rumours and oft-repeated assurances, that the proletariat has no intention of overriding the governing authorities and forcing them to stop the war. The love of country of the German is too strong to admit of such a turn of events. Again we have learned that Germany's man power will not fail her, as the fruits of generations of discipline ensure that even if vast hordes of men are sacrificed in massed advances, the whole nation is available for its military needs. Britain and her allies are therefore compelled to meet militarism with militarism and to go on untiringly and unhestitatingly until the goal has been gained in the field. We need men. We need efficiency in still greater measure. The enemy is in a strong position to-day because of the efficiency of organization and direction in every department of his civil and military machines.

How do we stand in regard to efficiency in the Australian Army Medical Service? There are few who have not been compelled to admit defects in organization and still greater defects in administration. The work of the individual medical officer, especially on the other side, has been of a high order of excellence. It is true that there have been exceptions and that the wrong man has been placed in some of the more important positions. Efficiency, however, is not so much dependent on the achievements of men instructed to carry out specific acts. It depends on the general scheme and on the capabilities of the heads of the several departments. It cannot be achieved unless there is cordial co-operation between each department and between the supreme authority and the men holding high office in the service.

In a letter published recently in our columns an anonymous correspondent has suggested that home appointments should be filled by men who have returned from active service abroad. Similar ideas have been put forward in other connexions in the past. We are under a deep debt of gratitude to every man who has left these shores to do his duty to his King and country. Each one has made a sacrifice and many have faced danger and risked their all. The stern game is still in progress and we have no right to allow our desire to show these brave men our gratitude at the expense of the country's safety. There should be but one qualification for any vacant positions in the Army Medical Service. The man who is most efficient for the work to be done, should be appointed. It is too dangerous to attempt to give preference to returned men, "other things being equal." Other means must be found for the purpose of repaying in part the losses sustained by men who have served in the battle field. While the war lasts we must secure the services of the best men for each special piece of work, and as a rule there is only one man who is "the best."

There is another aspect of this question. Too often experience is mistaken for efficiency. Because a man has had opportunities, it does not follow that he is more competent than another whose sphere of activity has been in a different department. Undiscovered ability is waste, and it must be recognized that competence can only be judged from the records of a man's work. There is only one way to minimize the waste resulting from the lack of op-

portunity. If every medical man in the Commonwealth were at the disposal of the military authority, and if it were the duty of certain local committees to discover the capabilities of each practitioner in their districts, there would be little difficulty in placing the right men in the right positions. We have appealed to the Branches of the British Medical Association in Autralia to call upon all those men who favoured compulsory enlistment to submit to a voluntary enrolment, provided that certain safeguards are assured. If every man of worth offered his services in this manner, the efficiency of the service would be materially enhanced. It may be that a wholesale re-organization is needed. It would be better to break up the whole machine and to build it up again on a sounder and wider basis, than to endeavour to muddle through with defects partly concealed and with an obvious loss of efficiency. Re-organization is possible without the aid of an unwieldly, unsavoury and undignified public enquiry.

IONIC MEDICATION.

Twelve years ago Lewis Jones noticed that marked improvement followed in certain pathological conditions, including rodent ulcer, arthritis of the knee joint and other inflammatory lesions, when he passed an electric current through the affected part and simultaneously ionized certain electrolytes at one or other pole. After much clinical experience he asserted that ions could be driven into the body and made to exert a powerful pharmacological action in this manner. The treatment was based on the well-known chemico-physical phenomenon of ionization. At a recent meeting of the New South Wales Branch of the British Medical Association Professor Vonwiller and Messrs. Myers and Grant gave excellent expositions of the action of electrical currents on electrolytes outside the human body. The employment of ionic medication has not become general, but many practitioners and a still larger number of unqualified persons use it and claim to obtain curative results from it. Before this method can be accepted as a standard therapeutic agent, it is incumbent on those who advocate it to prove that it is possible to force a therapeutic quantity of an active chemical element within a reasonably short space of time through a measurable thickness of tissue. The body is replete with electrolytes, and dissociation is constantly occurring within the body. This can be demonstrated without difficulty. When a metallic salt is introduced into the body, dissociation takes place and active anions and katkions can be demonstrated in the tissues. The toxicological action of the metals would be impossible unless free kations were liberated in the tissues. The passage of an electrical current through a portion of the body no doubt acts by moving ions in the direction from one electrode to the other. This movement, however, must be largely disturbed by the rapid movement of the fluids of the body, in the circulation of the blood and lymph and in the mechanical distribution of the fluids by muscular action. In order to gain a clear conception of the effect of an electrical current on free ions, two very simple experiments can be performed. A colloidal solution, such as a solution of protein in water, loses its clarity and becomes uniformly turbid when an electrolyte, such as sodium chloride, is added to it. The ions resulting from the dissociation of sodium chloride in solution move in all directions, and when those charged with positive electricity meet those charged with negative electricity, recombination occurs. The free ions, meeting the molecules in the colloidal solution, pass on the electrical charge and throw the molecules out of solution. It is therefore possible to see the effect of this irregular movement of ions in all directions, reflected in the molecules thrown out of solution. On the other hand, if an electrical current is passed from a platinum electrode through a solution of nickel sulphate or other metallic salt, to a second electrode, made of copper, the nickel or other metal will be gradually moved out of the solution on to the copper. In this case the ions travel in a definite direction. With the current ordinarily employed in ionic medication, the quantity of iodine which can be moved across a boundary in twenty minutes of approximately 8 mgrs. When the ion has to travel across the boundary between two electrolytes, the rate is diminished. If we ignore for the moment the effect of the circulating blood and lymph in the tissues, it will become evident that the amount of an iodine anion which can

be forced in the course of twenty minutes through five centimetres of tissues containing numberless electrolytes will be of the order of decimilligrammes or even centimilligrammes. But even these homœopathic doses must be carried away by the blood as fast as they are moved through the skin. There can be no question of any localized therapeutic action of the ion moved from outside to a lesion a measurable depth below the surface. If iodine or salicylic acid is capable of exerting a therapeutic effect on lesions within the body, it must be introduced in some other manner, in order that a sufficient quantity can reach the lesion. We are, therefore, forced to the conclusion that if benefit is derived from ionic medication, in the sense employed by Lewis Jones, that benefit must be effected either through the mind of the patient or as a result of some hitherto unsuspected electrical phenomenon.

Mr. Myers referred to a further use of ionization in medical practice, of which Turrell was named as the major exponent. This application is for the purpose of destroying bacteria in surface wounds. It is claimed by Mr. Myers that the passage of an electrical current through a solution of an electrolyte held in the cavity of a wound results in the electro-plating of the surface of the wound with the free ions. It is true that the velocity of ions in a solution is increased by the passage of an electrical current, but this increase is negligible when compared with that effected by a mechanical agitation of the fluid. A sinuous wound, with many pockets and potential burrows, can be filled with a solution of sodium chloride and mechanical means, such as pressure with a sterile swab or pad, can bring about a distension of all the pockets and sinuses, so that the solution is brought into contact with every part of the surface of the wound. If the solution is dilute, chlorine ions will come in contact with the surface in every part. The effect will be rapid. If a current be passed through the solution into the body, the mobility of the ions will be increased to some extent, but the action on the bacteria on the surface of the wound cannot be appreciably altered. Much more energetic chlorine action can be effected by the substitution of the unstable salts of hypochlorous acid. If the electrodes are situated in close proximity to the surface and are large, the surface of the wounds will come within the acid or alkaline area, and according to the intensity of the current, it will suffer together with the bacteria. A similar effect can be obtained by the application of a solution of hydrochloric acid or of sodium hydrate. No one has been able to demonstrate that ionization produces changes other than chemical changes, and until it has been proved to the contrary, it must be assumed that surface ionization acts in virtue of the nascent chemical element or compound. We therefore conclude that while ionic medication may be a useful method of applying suggestion, it is not a valuable pharmacological procedure.

IDENTIFICATION OF THE MENINGOCOCCUS.

In 1905 the meningococcus was detected in the nasal passages of persons who did not show any signs or symptoms of cerebro-spinal meningitis. In the same year some evidence was brought forward to suggest that these "carriers" of meningococci were concerned with the spreading of the disease through the community. The mouth, nose and pharynx are, however, infested with a very considerable bacterial flora. Many micro-organisms resembling meningicocci are present. It was therefore suggested that a quantitative study of the distribution of micro-organisms in the oral and nasal mucus might give more definite information as regards infectivity than any qualitative examination. Just as the number of colonies of *Bacillus coli communis* on a plate made with a sample of water supplies a useful indication of the suitability of the water as drinking water, so the number of colonies of Gram-negative cocci on plates made with mucus from the nose and throat, would yield an index of the infectivity of the nasal and oral secretions. This suggestion was not practicable as so many Gram-negative cocci appeared in nasal secretions. The differentiation of the meningococcus from other diplococci became of practical importance. At first, this was attempted by study of the fermentative qualities of the micro-organisms. Glucose, saccharose, maltose and galactose were found of service in this respect. Later, mannose was added to the list of test-substances as diplococci similar in other ways to meningococci were able to split this carbohydrate.

In 1915 Lieutenant-Colonel M. H. Gordon, who was put in charge of the investigation of cerebro-spinal meningitis by the Medical Research Committee, pointed out that the identification of the meningococcus in the secretion of the naso-pharynx could be made on the following characters. Colonies of meningococci appear on the plates when incubated at 37° C. for twenty-four to forty-eight hours. The colonies are clear, smooth, and transparent, with a firm outline. They are larger than the colonies of streptococci or pneumococci. A por-

tion of a colony emulsifies readily with a drop of water on a glass slide. Subcultures will grow at 37° C. but not at 23° C.. If more confirmation is needed, Lieutenant-Colonel Gordon advised culture on media containing sugars. The meningococcus ferments glucose with the formation of acid, but does not affect saccharose. The organism can also be recognised by agglutinative tests with anti-meningococcal serum.

In a recent communication[1] Lieutenant-Colonel Gordon points out that such an identification of the meningococcus would have been insufficient to limit the spreading of the infection. More accurate knowledge of the type of meningococcus present is needed before antisera can be utilized in a satisfactory manner. Steps have been therefore taken to determine by agglutinative and absorptive reactions the type of meningococcus present in different persons. These have shown that four types of meningococci are present in different cases. It appears that not more than a single type of meningococcus is present in the cerebro-spinal fluid of a patient. It has also been noticed that meningococci can be found invariably in the naso-pharynx of the patient at the commencement of the illness, and that these meningococci are of the same type as those that may be isolated from the cerebro-spinal fluid. The presence of meningococci in the throat has been of value in the diagnosis of atypical cases of the disease. While any particular outbreak may show one predominant type of meningococcus, the outbreaks tend to become confused. Some evidence has been obtained in support of the view that any antiserum that may be of service therapeutically, must be homologous with the monotypic meningococcus present.

ACIDOSIS IN CHILDREN.

The attention of the medical world has been attracted during recent times to a variety of symptoms associated with the appearance of acetone and certain acids in the urine. The term acidosis has been given to these conditions, more especially when they develope in the course of diabetes, the so-called toxæmias of pregnancy, chloroform poisoning and various pathological conditions manifested by vomiting and other digestive disturbances. Very little exact knowledge is possessed in regard to the changes which lead to a heightening of the hydrogen ion content of the blood, while the nature of the alleged disturbances of protein metabolism has yet to be worked out. Crile has shown experimentally that the removal of the supra-renal bodies and of the liver is followed by a definite increase of hydrogen ion concentration of the blood and by the appearance of acetone bodies in the urine prior to death. Many other observations have been made in this connexion, but more facts are required before it will be possible to weigh the evidence and to arrive at a proper understanding of the significance of these uncanny changes. Higgins, Peabody and Fitz found that even in normal individuals acetonuria developed when a carbo-hydrate free diet was persisted in. Many clinicians hold the opinion that the appearance of acetone and diacetic acid in the urine is a manifestation of an intolerance on the part of the body to carbo-hydrate starvation. At a meeting of the Medical Association of the Isthmian Canal Zone, held on July 15, 1916, Dr. Roland C. Connor[1] attempted to explain the occurrence of acidosis in children and especially in infants, when the supply of carbo-hydrate had not been diminished. In some of these cases the symptom complex is associated with an enlargement of the liver, changes in the kidneys or œdema of the brain. In the course of the discussion Dr. E. Hoffmann[2] offered an explanation which deserves careful consideration. He distinguished between what he termed a direct or active acidosis, such as that occurring in the course of diabetes, and an indirect or secondary acidosis, as is met with in children. He pre-supposes a primary over-supply of milk sugar and milk fat. The over-supply need not be an essential excess; it is merely excessive for the individual. The bacteria in the intestines effect an abnormal fermentation of this milk sugar and fat. Since the body objects to an excessive production of butyric or lactic acid, alkali is sent out to neutralize the acid formed by this fermentation. It must be remembered that the action of *bacillus acidi lactici* converts the monosaccharines into lactic acid, and *bacillus butyricus* converts the monosaccharines into butyric acid, carbon dioxide and hydrogen. Furthermore, it is suggested that when milk fat is hydrolyzed into glycerine and fatty acid, and the higher acids have been formed, a bacillus called by Moro, Finkelstein and Salge the blue bacillosis flora, is capable of reducing these higher acids (stearic, palmitic and oleic) into lower acids, such as valerianic and succinic acids. These acids are found in acute cases of acidosis in children. Moro has shown that *bacillus phlegmonis* is non-toxic when growing in an albuminous medium containing less than 1% of sugar. This bacillus is present normally in the intestine, and Dr. Hoffmann concludes that when the sugar in the intestinal contents exceeds 1%, it would give rise to an over-production of acid. The immediate result would be an impoverishment of alkali, an alkalipænia. As more and more acid is produced, the intestinal epithelium becomes increasingly affected and ultimately becomes impermeable to sugar, albumin and acids. Simultaneously the renal epithelium is attacked, and albumin, sugar and acids appear in the urine. Dr. Hoffmann claims that the condition can be rectified by diminishing the intake of milk sugar. A special form of albuminated milk is employed. The milk sugar has been diminished to 25% in this preparation. The fermentative bacteria in the intestine are thus deprived of a pabulum suitable to their continued growth, while the putrefying bacteria are given an opportunity of gaining the overhand. As soon as the putrefying bacteria are well established, carbo-hydrates can be given freely without any danger of acid intoxication. The fermentative bacteria have been overgrown.

[1] *Journ. Roy. Army Med. Corps*, vol. xxx., p. 1, January, 1918.

[1] Proceedings of the Medical Association of the Isthmian Canal Zone, July, 1916, to December, 1916, Vol. IX., Part 2, Published 1918.
[2] Ibid.

BONE LESIONS IN YAWS.

The study of frambœsia has led to a very considerable literature, larger perhaps than would be justified from the extent and significance of the disease itself. Its relation to syphilis has provoked an extensive interest in the data which have been collected concerning the ætiology, pathology and therapeutics of this affection. Our knowledge of the nature of the tertiary lesions in yaws has been greatly extended by the observations of McCarthy, Daniels, Boissière and Castellani. Meisser, Bauermann and Halberstädter demonstrated in 1906 that the virus could be recovered from the medulla of bone of monkeys artificially infected with yaws, while others have proved that destructive lesions of bones occurred in the course of a general infection with the *Spirochæta pertenuis*. Dr. Herman G. Maul has contributed to our knowledge of the clinical and Röntgenological aspects of bone lesions in yaws.[1] He has studied a series of one hundred patients in the Department Hospital at Manilla, and has detected bone lesions in no less than 31 of them. In many cases the involvement of bones and joints was unsuspected until the skiagram revealed oval or elliptical rarefied areas. In twenty-six of the patients the bone lesions were multiple, and in five they were numerous. When the articular surfaces were involved the patients complained of pain in the joints. The commonest site of these lesions was the shaft of the long bones and the bone most frequently implicated was the tibia. These tertiary osseous lesions were seen not earlier than six months after the appearance of the primary lesion. The longest interval was nine years. The average interval was two years and nine months, while the majority of the patients had had their primary lesions about one year before the bones became affected. Treatment by Castellani's iodide and salicylate mixture was followed in the majority of the cases by gradual disappearance of the lesions, provided that they were not very severe. Dr. Maul found salvarsan to be a specific. The changes disappeared very rapidly and regeneration of bone followed its use. The differentiation between syphilitic bone lesions and these lesions of yaws depends on the recognition of the primary involvement of the cortex of the bone and the absence of periosteal proliferation in the latter. The history and the skiagraphic appearances suffice to distinguish the two diseases from one another.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A meeting of the Senate of the University of Sydney was held on April 8, 1918, at University Chambers, Phillip Street, Sydney.

With reference to the death of Sir John Madden, Chancellor of the University of Melbourne, the following resolution was carried on the motion of the Vice-Chancellor:—

> The Chancellor, Vice-Chancellor and Fellows of the Senate of the University of Sydney desire to convey to the Council and members of the University of Melbourne an expression of their sympathy in the loss which has been sustained by the University through the death of the Chancellor, the Hon. Sir John Madden, G.C.M.G., B.A., LL.B., D.C.L., who guided the affairs of the University with such distinguished ability and sound judgement during the long period of his office.

Sir William Cullen was re-elected Chancellor of the University for the triennial period.

Dr. Purser was re-elected Vice-Chancellor for the period of one year.

The following Standing Committees were appointed:—

Finance Committee.—The Chancellor, the Vice-Chancellor, His Honour Judge Backhouse, the Honourable Mr. Justice Ferguson, F. Leverrier, Esq., and R. Teece, Esq.

Buildings and Grounds Committee.—The Chancellor, the Vice-Chancellor, Judge Backhouse, P. Board, Esq., F. Leverrier, Esq., Sir Thomas Anderson Stuart, Professor Warren, J. Nangle, Esq., and J. J. C. Bradfield, Esq.

Orient Passages Committee.—The Chancellor, the Vice-Chancellor and Professor MacCallum.

Organ Committee.—The Chancellor, the Vice-Chancellor, the Hon. Mr. Justice Street, Sir Thomas Anderson Stuart, Professor Fawsitt and F. Leverrier, Esq.

Macleay Museum Committee.—Acting-Professor Cotton, Professor Johnston and Professor Wilson.

Museum of Normal and Morbid Anatomy.—Sir Thomas Anderson Stuart, Professors Wilson and Welsh.

The date of conferring of degrees was fixed for April 13, 1918.

The Annual Report and Financial Statements were adopted.

A letter was received from Professor David, acknowledging the extension of his leave of absence.

An application was received from Professor Chapman for a Lecturer in Pharmacy. It was resolved that applications be invited in Australia and New Zealand, and that the application be agreed to.

A joint letter from Professor Chapman and Dr. F. P. Sandes in regard to accommodation for pharmacology and surgery was referred to the Buildings and Grounds Committee for report.

The following appointments were made:—

(*a*) On the recommendation of the Professor of Zoology: Mr. Lancelot Harrison, B.Sc., Lecturer and Demonstrator in Zoology; Mr. E. A. Briggs, B.Sc., Temporary Demonstrator for Lent Term.

(*b*) On the recommendation of the Professor of Pathology: Dr. A. Watson Munro, Part-Time Demonstrator in Pathology.

(*c*) On the recommendation of the Professor of Anatomy: Half-Time Demonstrators—J. T. Hunter and W. T. D. Maxwell.

The following appointments were also made:—

(*a*) Chemistry: W. J. Kirchner, B.Sc.
(*b*) Civil Engineering: Acting-Demonstrator, V. Keniff.
(*c*) Surveying: Demonstrator, C. J. Watt.
(*d*) Botany: Lecturer and Demonstrator, J. Small, B.Sc.
(*e*) Veterinary Science: C. J. M. Walters, B.V.Sc.
(*f*) Physics: M. H. Belz.

The recommendation of the Professorial Board in regard to the award of the Travelling Post-Graduate Scholarships was adopted in the following amended form:—

> That the award of Travelling Post-Graduate Scholarships be suspended; and that candidates who would have been eligible for any of the lapsed scholarships, be considered eligible when the awards are resumed.

The following recommendation contained in a report from the Faculty of Science was adopted:—

1. That By-law Chapter XXI., Section 8, be amended by the insertion of the following words after "Organic Chemistry, Pure and Applied":—

> Provided that, before admission to the course in Organic Chemistry (Pure and Applied), candidates shall have obtained a pass at the higher standard in the Organic Chemistry Section of Chemistry II. at the second year examination.

2. That the John Coutts Scholarship for 1918 be awarded to Mr. M. H. Belz.

3. That for this year only, second year science students be permitted to take a course in Philosophy I. (Logic and Psychology), Education, or a language in conjunction with any two of the subjects specified in By-law Chapter XXI., Section 7, in order to complete the second year examination.

Abstracts from Current Medical Literature.

THERAPEUTICS.

(145) Rosenow's Antipoliomyelitic Serum.

H. L. Amoss and F. Eberson have carried out series of experiments upon monkeys with Rosenow's antipoliomyelitic serum and with the immune serum obtained from monkeys convalescent from experimental poliomyelitis (*Journ. Exper. Medicine*, February, 1918). Although the serum derived from patients who have recovered from poliomyelitis is capable of neutralizing *in vitro* the virus of the disease, it has not been possible to induce the formation of antibodies by the injection of the virus of poliomyelitis into any domestic animal. Rosenow and Nuzum and Willy assert that animals immunized against the streptococci, cultivated from cases of poliomyelitis, exhibit various antagonisms to the poliomyelitic virus. It is claimed that horses, injected with cultures of these streptococci, yield sera which possess neutralizing and therapeutic properties, even when applied to man. The authors' experiments have been made by introducing the active virus of poliomyelitis into the blood stream of *Macacus rhesus* monkeys. Four sets of monkeys have been utilized. One set served as a control. The second set received intraspinal injections of normal horse serum. The third set was given intraspinal injections of Rosenow's serum and the fourth set intraspinal injections of the serum of monkeys convalescent from experimental poliomyelitis. The control monkeys and those receiving the immune serum from the convalescent monkeys have not developed any paralysis, but the monkeys injected intraspinally with Rosenow's serum or with normal horse serum and receiving the virus of poliomyelitis intravenously, have all exhibited paralysis. The serum of Rosenow promotes the passage of the virus of poliomyelitis through the meninges in the same way as normal horse serum. No signs of any protective action has been manifested. Since the antibodies in the sera of convalescent monkeys and in convalescent patients are identical, the authors conclude that the antibodies in Rosenow's serum are not identical with those in the serum of a convalescent patient.

(146) Absorption of Drugs from the Vagina.

D. I. Macht records a series of experiments upon dogs and cats in which drugs have been introduced into the vagina (*Journ. Pharm. and Exper. Therapeutics*, January, 1918). The vagina is usually regarded as an organ incapable of absorbing pharmacological agents. A study of medical literature in all languages, however, provides many instances of poisoning following the introduction of poisons into the vagina. Arsenic, belladonna, iodoform, phenol and mercuric chloride seem to have been absorbed from the vagina. The author's experiments have been made on cats and dogs. Dogs have been chiefly used since the vagina shows the same histological features as the human vagina. It is also easy in the dog to prevent the drugs entering the uterus. The evidence of absorption has been either pharmacodynamic or toxicological or it has been chemical. In some cases evidence of both kinds has been obtained. The introduction of one decigramme of apomorphine into the vagina of a bitch, weighing 8 kilos, has caused vomiting in four minutes. Morphine in a similar dose causes vomiting in five minutes. Five centigrammes of pilocarpine has produced profuse salivation in half an hour. Atropine introduced in 5 cg. dose paralyses the cardiac vagal nervous endings. Cocaine leads to a fall of blood-pressure and to convulsions. Aconite produces a characteristic action on the carotid blood-pressure within three minutes of its introduction into the vagina. Potassium iodide can be detected in the urine one hour after its administration. Potassium ferrocyanide can be demonstrated in the urine after the same interval of time. Potassium cyanide gives rise to characteristic poisoning. Nitroglycerine causes a typical fall in arterial blood-pressure. Phenol affects the blood-pressure when the vagina is irritated with a 2% aqueous solution for five minutes. Cresol acts the same manner. Mercuric chloride is absorbed and traces of mercury can be detected in the urine after some hours. The author emphasizes the danger of employing powerful drugs indiscriminately in the form of douches, tampons and uterine wafers.

(147) Clinical Action of Preparations of Veratrum.

R. J. Collins and P. J. Hanzlik have made a further study of the lessening of the pulse rate and the diminution in the systolic and diastolic blood-pressures produced by the administration of preparations of *Veratrum album* (*Journ. Pharm. and Exper. Therapeutics*, February, 1918). Observations have been made on two healthy persons and upon 27 patients suffering from various circulatory disorders. The subjects have been kept in bed during the administration of the drug which has been used as a tincture containing 10% of *Veratrum album*. On standardization this tincture gives a minimal fatal dose for frogs at 0.6 gm. and and for guinea-pigs at 0.025 gm. The blood pressure has been measured by the auscultatory method. Single therapeutic doses of 10 to 13 dl. (15 to 20 min.) slow the pulse rate and lower the blood pressure without giving rise to any sensations of burning in the stomach, nausea or vomiting. Large or repeated doses (17 to 50 dl.) give rise to similar effects of a more pronounced character, but the "toxic" symptoms may be pronounced. The action of the pulse and blood-pressure can be obtained with doses of 30 to 35 dl. (45 to 55 min.) administered at the rate of 7 to 10 dl. each hour. No "toxic" symptoms are produced, when the drug is given in this way. The fall of pressure is produced much more slowly than with nitrites, so that the maximal effect after single doses is seen from one to two hours after administration. The study of cadiographic tracings shows no alteration in the character of the record of the heart beats except a general shortening in the time of each phase.

(148) An Isomer of Caffeine.

W. Salant and H. Connet have examined an isomer of caffeine recently synthetized by Johns (*Journ. Pharm. and Exper. Therapeutics*, February, 1918). Whereas caffeine is 1:3:7—trimethyl—2:6—dioxypurin, the new isomer is 1:7:9—trimethyl—2:8—dioxypurin. The investigation has been carried out by comparing the pharmacological action of the new isomer with that of caffeine. The new isomer is less toxic to frogs. The lethal dose for caffeine is 0.3 to 0.35 gm. per kilo of frog, while that of the new isomer is about 4.5 gm. per kilo of frog. Increased reflex activity is observed in the frog after doses of one gramme per kilo of the new isomer, but convulsions are only occasionally seen even with lethal doses. Experiments have been made on the isolated heart of the frog by perfusing it alternately with solutions containing caffeine and the new isomer. The drug has not affected the rate of the heart beat, though the force of the cardiac contraction has been slightly augmented. The diuretic action of the new isomer has been compared upon rabbits, well fed with hay and oats, with that of caffeine. Its action has not been constant, a moderate increase in the amount of urine excreted being observed in some rabbits, but no increase in others.

(149) Salicyluric Acid.

P. Hanzlik (*Journ. Pharmacology and Exper. Therapeutics*, December, 1917) has not succeeded in isolating salicyluric acid from the urines of patients who have taken salicylic acid either as the sodium salt or as oil of wintergreen. The author has tested a number of methods described as suitable for isolating salicyluric acid from urine. The products of the extraction appear to be salicylic acid, though this substance was not isolated in a pure form. At any rate no glycocoll could be obtained

from any specimen of urinary "salicyluric acid." When synthetic salicyluric acid was added to urine it could be readily recovered.

UROLOGY.

(150) Intraspinal Therapy in Urology.

Having treated 16 patients who were suffering from tabes and cerebro-spinal syphilis by injecting mercurialized serum and salvanized serum, and having noted the effect of this treatment on the urological signs and symptoms, E. M. Watson considers himself justified in drawing certain conclusions (*Journ. Amer. Med. Assoc.*, February 2, 1918). Three of his patients had complete or marked urinary incontinence. One was cured of this symptom, one was greatly improved, and the third was unimproved. Slight incontinence was met with in seven patients; three of them were cured, and four were greatly relieved. Eight patients had increased frequency of urination. As a result of treatment, four patients were enabled to retain their urine for three or four hours. In the other four a distinct improvement was recorded. Dribbling of urine, which was present in ten cases, disappeared in four and was lessened in six. Complete or partial loss of sexual power was present in 15 patients. The power returned to some extent in eight of these patients; of two of the eight it is stated that the power was completely restored. Eleven of the patients had pains in the back and legs, varying from a dull ache to the characteristic lightning pains. The author reports that these pains disappeared entirely. Twelve patients were unable to empty their bladders completely. After treatment, five patients had no residual urine, and in three others it was reduced to less than 60 c.cm. The treatment consisted in the injection of 30 c.cm. of mercurialized serum. This was prepared by dissolving 0.0015 to 0.003 gramme of mercuric chloride in normal horse serum and diluting to 30 c.cm. with physiological salt solution.

(151) Pseudo-Prostatism of Alcoholic Origin.

According to Leon Chevenot, some alcoholics suffer from disturbances of micturition which can be traced either to changes in the vesical muscle or in the nerves of the bladder, or to sclerotic changes in the prostate (*Urolog. and Cutan. Review*, February, 1918). In these cases the prostate is not hypertrophied. The patients are usually relatively young. Frequently there are other signs of alcoholism, including tremors, anorexia and morning cough. The urinary stream is feeble and even intermittent. The last drops are difficult to expel. Nocturnal pollakuria is also present. The bladder may be distended. The absence of hypertrophy is evident on rectal examination, but the prostate may feel smaller than usual and harder. The atony of the bladder muscle is the result of progressive distention. The atony is part of a general weakening of the muscles and is not a special bladder affection. The sensibility of the bladder is dulled as a result of the alcoholic intoxication, and consequently the desire to micturate is lessened. The changes in the prostate are of a fibrotic nature and arise as a consequence of the congestion of the vesical vessels. The differential diagnosis between this condition and hypertrophy of the prostate is made by a rectal examination and by cystoscopy. The occurrence of alcoholism in a patient is often associated with hypertrophy of the prostrate. Tabes and other lesions of the cord must be distinguished from this condition. The treatment consists in the withdrawal of alcohol and the proper dieting of the patient. Locally repeated catheterization is essential. A catheter should be passed every time the patient feels a desire to urinate. The contractility of the bladder should be restored by washing it out with silver nitrate solution. In severe cases it may be necessary to have recourse to a permanent drainage of the bladder. The author speaks of an operation of invaginating the wall of the bladder, in order to restore its contractile power by narrowing the organ. He gives brief clinical histories of seven cases.

(152) Exstrophy of the Bladder.

The highly unsatisfactory results of the operative methods employed to remove the grave disabilities associated with exstrophy of the bladder have led many surgeons to exercise their ingenuity in planning new devices. It is stated that one-half of the infants born with this malformation do not live ten years, and that nearly all die before the age of 40. Plastic closure has been discarded, on account of the deposition of lime salts on the hair of the skin used to cover the defect, and of the inevitable foulness of the uncontrolled bladder. Charles H. Mayo (*Journ. Amer. Med. Assoc.*, December 22, 1917) deals with those operations which consist in the transplantation of the ureters into a loop of bowel. After dealing briefly with Gersuny's operation and its various modifications, he points out that in all these nature's method of emptying the duct by indirection has been persistently ignored. He therefore turns to two operations in which the ureter is tubularized for a short distance before it is allowed to enter the bowel. The first is Stiles's operation, in which the ureter is passed into the intestine through a small opening and is depressed into the bowel, which is folded over it, the folds being held by sutures. Coffrey's method depends on the insinuation of the cut ureter between the peritoneum and the *muscularis* of the intestine before it is allowed to pass through a small opening. The method of suture is also calculated to leave a natural duct entrance. He gives some details of the technique. He points out that the patient should not be operated on until he is from three and a half to five years of age. Of 37 patients, six were operated on by the plastic method, and one died. The six patients did not attain control over their bladders. Three patients were operated on by Mayd-Moynihan's operation, and two died of uræmia. Thirteen patients were operated on by the transplantation method, one died of the operation, one died of pneumonia a few weeks after leaving the hospital, one died of pulmonary tuberculosis three years later, and one died of enteric fever three years later.

(153) Supra-pubic Puncture of the Bladder.

N. P. Rathbun endeavours to alter the usual indications for supra-pubic puncture of the bladder from a procedure rarely warranted to an operation of choice (*Urolog. and Cutan. Review*, March, 1918). He finds it of considerable value in cases of tight stricture of the urethra, complicated by acute retention. After unskilled attempts to pass a filiform bougie have wounded the urethra considerably, he refrains from any further attempts to pass an instrument, and immediately punctures the bladder through the supra-pubic region and drains the organ slowly. A stock mixed vaccine and rest usually restore the condition of the urethra and after from three to seven days, it becomes easy to pass a filiform guide. He also uses puncture for partial or complete retention due to prostatic adenomata. In these cases it is difficult or impossible to pass a catheter. Previous unskilled attempts have often complicated the condition. The supra-pubic puncture is performed as a preliminary measure. It serves as the first stage to prostatectomy. In the third place he punctures the bladder above the pubes for retention caused by acute inflammatory conditions of the prostate, whether due to the gonococcus or not. The gland is often much swollen in this condition, and he claims that it is bad surgery to irritate the inflamed urethra by attempting to pass an instrument.

(154) A Long Retained Catheter.

W. C. Danforth (*Urolog. and Cutan. Review*, February, 1918) records a case in which a woman, aged 30 years, was found to have retained a portion of a gum elastic catheter in the bladder for thirteen years. The woman was in the seventh month of pregnancy and complained of pains, which were mistaken for labour pains. The nurse discovered the tip of the catheter protruding from the urethra and forthwith withdrew it. There was about a calculus measuring about four centimetres at one end and the whole length of the foreign body was ten centimetres. No further bladder symptoms developed.

British Medical Association News.

SCIENTIFIC.

A meeting of the New South Wales Branch was held at the B.M.A. Building, 30-34 Elizabeth Street, Sydney, on April 12, 1918, Dr. A. A. Palmer, the President, in the chair.

The members of the New South Wales Section of the Electrical Association of Australia and the members of the Dental Council of New South Wales were invited to be present.

Professor O. U. Vonwiller gave an account of the theory of conduction in electrolytes. He pointed out that the passage of electric currents through certain substances called electrolytes was accompanied by chemical changes. The substances were decomposed and the products of decomposition were deposited on the electrodes. The process was called electrolysis. Faraday's laws were as follows:—

(1) The amount of chemical decomposition taking place in a given time is proportional to the quantity of electricity passing in that time.

(2) The mass of any substance liberated by a given quantity of electricity is proportional to the chemical equivalent of that substance.

Faraday called the products of decomposition ions, those deposited at the anode anions, and those deposited at the kathode kations. The accepted theory of electrolytic conduction was that certain of the molecules in the solution were broken up or dissociated into two or more components, some of which carried positive charges and the other negative charges, the total amounts of positive and negative electricity being equal. Their components moved in opposite directions, the positively charged particles moved towards the kathode, while the negatively charged moved towards the anode. It was usual to speak of these charged particles as ions, although Faraday employed the term in reference to the accumulated substance. He therefore used the term exclusively in this sense. Metallic atoms in solutions of metallic salts were always positively charged, while the other ions were negatively charged. In the case of acids, hydrogen acted like a metal. The charge on a single ion was numerically equal to, or was a small multiple of, the charge of an electron. This charge was 1.60×10^{-20} electro-magnetic unit, and was usually represented by e. The charge carried on an ion was equal to e multiplied by the valency of the ion.

Professor Vonwiller performed some simple experiments illustrating the dissociation of copper sulphate and of a soluble cobalt salt, for the purpose of demonstrating that the quantity of free ions in a given solution of electrolytes depended on the dilution of the substance.

In the next place, he explained how secondary reactions occasionally occurred when a complex ion, *e.g.*, SO_4, arrived at the electrode. This secondary reaction could take the form of a combination between the ion and an atom of the electrode, or it might take the form of a reaction with water with the subsequent evolution of oxygen. The conductivity of a solution should be proportional to the number of ions present. It was found, however, that the conductivity increased with the strength of the solution, but was not proportional to the concentration, the proportion of dissociated molecules apparently decreasing with the increase of concentration.

Professor Vonwiller showed that if an ion came within a certain distance of an ion charged with electricity of opposite sign, the electrostatic attracting force caused them to combine to form a neutral molecule of the salt; consequently, in a solution of electrons recombination occurred simultaneously with the production of ions. In concentrated solutions recombination took place actively, while in very dilute solutions the ion might remain free for a long time.

In the next place, he dealt with the mobility of ions. When a current flowed through an electrolyte, the average velocity of the ions was proportional to the mechanical force acting on them. He expressed this in another way by stating that it was proportional to the potential gradient. The velocity varied with ions of different kinds for the same potential gradient. The term mobility was used to signify the velocity of an ion when the potential gradient was one volt per centimetre. The mobilities of some ions in dilute aqueous solution at about 19° C. were:—Hydrogen, 330; potassium, 67; chlorine, 68; iodine, 69; SO_4, 35, the unit of velocity in each being 0.00001 centimetre per second. The apparent mobilities decreased when the concentration was increased. The shares taken by two kinds of ions in the conduction at some distance from the electrodes might differ considerably on account of the difference in mobility. The ratio of the mobility of the anion to the sum of the mobilities of the kation and anion was called the migration ratio or the transport number. When more than one compound was present in the solution, three or more different kinds of ions might be present. Each of these ions would contribute to the current an amount proportional to the average number present of that kind. If two different electrolytes were placed in contact, the passage of the current across the boundary involved the transfer of ions from one to the other. Many of the recent determinations of ionic mobility have been made upon methods based on this effect, the presence of the advancing ion being shown by a change of colour due to its action on some indicator.

The quantity of any substance introduced by electrolytic means into a medium in a given time could be calculated in simple cases. The speaker, however, pointed out that in the case of ionic medication the conditions were too complex to admit of estimation. With potassium iodide and potassium chloride in aqueous solution, the mobilities of the three ions were practically the same, and half of the current across the boundary was due to the transfer of potassium ions and half to the transfer of iodine ions in the opposite direction. A current of 10 milliampères would result in the transfer of nearly 0.008 gramme of iodine in 20 minutes.

Mr. W. H. Myers gave a demonstration on some practical points in ionic medication as a result of investigations carried out jointly by himself and Mr. R. Grant. He said that they had started their experiments unbiassed by any previous work that might have been carried out in this direction. They had to study electro-chemical and bacterial action. Members of the Electrical Association would realize that in dealing with human beings the conditions were very different to those met with in pure solutions of electrolytes. They had analyzed each point, and had considered how far it might have application in the human body. They had found that it had been possible to apply electrodes to the surface of the body for the purpose of removing bacteria. He referred to some work which they had been carrying out on the electrical sterilization of milk, during the course of which they had made use of jellies. The forms of jelly used were gelatine when an animal jelly was required, and agar-agar when they wanted a vegetable jelly. They had found that the rate of diffusion of ions in jellies was practically equal to that in still liquids.

After dealing with the physical properties of the jellies employed, Mr. Myers demonstrated on the screen the effect of a current passing through a jelly containing common salt. Carbon electrodes were used immersed in the jelly to the depth of about three millimetres. The current employed was from 40 to 45 volts. One-sixth of an ampère was used. Mr. Myers assumed that the potential gradient was the same as in ordinary ionic medication. The effect was rendered visible by the reddening of the litmus at the positive pole and the development of a blue colour at the negative pole. He admitted that the fluids of the body did not behave exactly like sodium chloride solution. Before leaving this simple demonstration he showed that the acid and alkaline areas became neutral tinted after the reversal of the current.

In the second experiment jellies had been sown with *bacillus coli*. The electrodes used were of platinum. It was seen that the acid and alkaline areas had increased by normal diffusion to some extent during the 24 hours following the passage of the current. The bacteria in the acid and alkaline areas had not grown, whereas in the interpolar space, where there was a uniform chemical medium, there was abundant growth. The next slide showed a similar action on the growth of *staphylococcus albus*. He pointed out that the spores of *bacillus subtilis*, which were

capable of resisting a temperature of 100° C., were also killed in the acid or alkaline areas. It was possible to sterilize instruments by immersing them in salt solution and passing an electrical current through the solution.

The next demonstration was conducted with normal ox serum and sodium chloride. It was seen that a coagulation of the serum took place in the acid area, while the alkaline area became increasingly translucent. In a further experiment it was shown that a current passed through a jelly containing ox serum on which bacteria had been inoculated, effected a bactericidal action. Mr. Myer referred to a paper which had been published by W. J. Turrell on the electrical treatment of wounds, in which the author stated that he had treated superficial wounds by ionic medication and had obtained better results than when he had employed hypertonic solutions.

The next series of demonstrations were set up with a view to the determination of the effects of currents passing through the boundaries between two distinct electrolytes. An electro-chemical action takes place whenever there is a sudden drop in potential gradient. The first preparation shown on the screen consisted in sodium chloride in serum with 2% agar-agar added, interrupted by two strips of ordinary NaCl jelly. He explained that the litmus used as an indicator would move bodily towards the positive electrode. The experiment was not very successful, inasmuch as the action was slow and was interfered with by the overheating of the strata. A similar experiment was shown with phenolphthalein as indicator. Although he was not prepared to imitate experimentally the extremely minute and delicate actions which took place in living tissue and which were known as metabolic changes, he suggested that tissue metabolism was increased in certain affections under the influence of ionization. He made the further suggestion that an ion could not be forced from a solution outside through the body, unless the body contained the same ion. In the next experiment a mixture of starch and sodium chloride was separated from a solution of potassium iodide in jelly by a strip of jelly. On the passage of the current, the iodine anion travelled across the boundary and was visualized as soon as it met the starch. Simultaneously, the development of HCl at the positive electrode and of KOH at the negative electrode was seen. The rate of the passage of iodine through the jelly was, however, slow, and distinct blueing in the starch area was not seen during the time specimen was reflected on the screen. He was not prepared to state that the iodine forced ionically to travel in this way through the skin or sweat glands, would advance precisely in this manner. Human tissues would not withstand its action if they could so. He also called attention to the fact that iodides and iodates would be formed in the system, and, further, that the blood and lymph would carry these salts off to some extent. He claimed, however, that the experiment showed that these ions could be forced beyond the boundaries of their own electrolytes and that ionic medication provided a much more powerful method of introducing a desired chemical element into the body than the application of liniments, etc. He repeated the same experiment with salicylic acid, and demonstrated quite clearly the movement of these ions across the boundary.

Mr. Myers referred those who doubted the ability of ions to pass through the skin, to the work of Le Duc. He admitted doubt as to the exact depth to which a particular ion would penetrate in a given time to a given part of an individual. He maintained that the only solution to the problem lay in actual clinical practice.

In the course of their experiments, Mr. Grant and he had observed certain phenomena in living tissue through which a direct current was passing. In the first place, there was a stimulation of glandular action in the region of greatest current density. In the next place, there was an increase in the blood and lymph flow, especially in the neighbourhood of the electrodes. The hyperæmia was more marked near the negative electrode than near the positive one. The third observation they had made was that at times there was a decrease of pain or a sedative effect in the area beneath the positive electrode. The last observation they had made was that there was a decrease or total cessation of pain, particularly in neuritic cases, immediately following the application of a comparatively heavy current for from 20 to 60 minutes, and that the cessation of pain was frequently permanent. Mr. Myers referred to the work of Russ on the electrical treatment of gonorrhoea. Russ held that there was an active migration of gonococci towards the positive electrode. He based his opinion on an experiment *in vitro*. If a direct current were passed through a suspension of bacteria in saline solution contained in a "U" shaped tube, the suspension gradually cleared at the end containing the negative electrode and became more dense at the other end. In their opinion, the success obtained by Russ was due partly to the bactericidal action demonstrated in their experiments and partly to the mechanical washing out of the bacteria from the glands and crypts of the urethra by the stimulation of glandular action.

He then passed on to describe the technique employed for medical purposes. He regarded it as too dangerous to utilize electrical energy directly from the electric light supply mains. He demonstrated several pieces of apparatus which they had had constructed for the purpose. Dry cells were used and special care was given to the connexions. The resistance which they employed admitted of a very gradual cutting out of current. They regarded a reversing switch as essential. The milliampère metre could be shunted so as to give two scale readings. In regard to electrodes, they had found that lint soaked in a solution of electrolyte was liable to cause ulceration. By means of a special process jelly could be rendered elastic and pliable and the electrolyte could be included in it. These jelly pads made excellent electrodes, and when they were used it was possible to increase the current to 7, 8, or even 10 millampères per square inch. He also demonstrated various special electrodes and a sterilization plant for instruments.

Mr. G. A. Julius, the President of the New South Wales Section of the Electrical Association of Australia, delivered a message from the first President of the Association, in which he expressed his regret that he was unable to be present at the meeting. He called attention to the fact that the members of the Electrical Association were anxious to collaborate with the medical profession, and that they could provide less costly electrical apparatus than that imported from overseas.

Dr. J. Burton Cleland congratulated Messrs. Myers and Grant on the admirable work they had carried out. He spoke of the excellent result of an electrical ionization in deep-seated lesions. It was difficult to explain how the relief of pain could be brought about by these means. In former times they had attributed to certain drugs what was known as an alterative action. He suggested that ionization might act in this way. It certainly relieved pain in chronic rheumatism and many other affections.

Professor H. G. Chapman said that he had had great pleasure in listening to and watching the demonstration. The effects which had been shown were in reality brought about by chemical substances. The bactericidal effect was a chemical action. He agreed that it was possible to destroy bacteria at some depth below the skin surface, just as they could be destroyed on the surface, but the current necessary to bring this about would also leave its effect on the tissue cells. The cells would be destroyed with the bacteria. In the next place, he raised the question of the possibility of transferring medicinal doses to the deeper tissues. Mr. Myers had stated that the iodine in a solution could be completely removed through the skin by direct current. It was doubtful whether this actually took place. Small quantities could be transferred through the surface into a joint, but he maintained that no appreciable quantity could be carried into the deeper tissues. In his own experiments he had never seen the whole quantity of iodine pass into the tissues. When a small quantity of iodine was given by mouth, such as 0.3 grammes, the iodine could be detected in the urine. He asked Mr. Myers whether he had been able to detect any iodine in the urine after potassium iodide had been applied to the surface and a current passed. He suggested that there was a much more efficient way of passing iodine into the tissues. If three grammes of potassium iodide were given by the mouth, the whole quantity would appear in the blood within a few minutes. The concentration in the blood could be calculated without

difficulty. A man of average weight had about three litres of blood in his body, and consequently the concentration would be 1 in 1,000. If an electrical current were then passed, it would only be necessary for the iodine ions to travel a fraction of a millimetre in order to leave the blood stream and arrive at the affected tissue. This would be a much better method of applying iodine than that described by Mr. Grant. He pointed out that the velocity of the blood stream was infinitely greater than the velocity of ions, and consequently when an ion was passed through the surface to the tissues, it would be immediately swept away. He suggested that Mr. Myers and Mr. Grant should measure the exact amount of iodine or salicylic acid removed from the solution into the tissues.

Mr. R. Moss Withycombe congratulated Messrs. Myers and Grant on their communication. He stated that as a dentist he was in a position to affirm that ionization was the only way of effecting the sterilization of the apices of teeth and of the periodontal areas. He admitted that a preliminary disinfection and some instrumentation were necessary before ionization could cure pyorrhoea, but he maintained that this method had yielded extraordinary good results in his hands. He referred to the excellent results obtained in pyorrhoea by ionization in America, and quoted some opinions which had been expressed in favour of this method.

Dr. E. H. Molesworth asked Mr. Myers a series of questions. He wanted to know if in the sterilization of instruments the action was a chemical or a physical one. Was the destruction of the bacteria due to an electrical action? Did it matter what substance was used in the treatment of a surface lesion, if it were desired to apply a given ion? If the action were a chemical one, was the ion inserted between the molecules or merely between the cells? Was the action due to the introduction of fresh ions from without? Was the pain produced by 10 milliampères per square inch through a gelatine electrode tolerable? Which ions had proved to be the most useful in sterilizing the surface?

Dr. A. S. Vallack expressed the opinion that the psychic factor should be taken into account. He referred to conditions which were formerly alleged to be due to uric acid and which were now called neurotic. In the treatment of these conditions faith cures had scored more heavily than anything else. He spoke of the relief of pain which followed when one individual carried a potato in his pocket, or when another individual wound round his body red silk which had been imported from Europe. He was glad to note that Professor Chapman had taken up an attitude of healthy scepticism. In regard to the bactericidal action, he called attention to the fact that, after all, the action of the perchloride of mercury was an ionic one. The salt had no value without water. It was a chemical action, although there was no doubt that the movement of free ions was greatly increased by the passage of a current. In conclusion, he insisted that the psychological aspect was an extremely important one.

Dr. R. B. Wade disclaimed any special knowledge of the science of electricity. He had observed clinical results from the application of ionization. In certain types of cases this method had produced good results. These included painful nerve bulbs, painful scars, lumbago, etc. Relief from pain was certainly obtained in these cases by ionization. In some cases the action was very swift and in others it was very slow. He was not prepared to estimate how much of the relief of pain was a psychic action. He was afraid that Mr. Myers' paper had not helped them materially. What they wanted to know was how far an ion could penetrate into the tissues. If it got into the tissues, he wanted proof that it actually did good. He compared the clinical results of ionization to the results obtained by poulticing, dry cupping and the like for chronic inflammatory lesions. There was the same flushing of the skin and the same localized hyperæmia. In conclusion, he thanked Professor Vonwiller and Mr. Myers for their interesting communications.

Dr. H. C. Moxham, President of the Dental Council of New South Wales, thanked the New South Wales members of the British Medical Association for inviting the dentists to attend the meeting. He protested most emphatically against Mr. Withycombe's expressions of opinion. He was disinclined tto accept an American opinion which was based on alleged "wonderful cures." Dentists were not adopting ionization in their practice generally, because it was held that it had no specific action on bacteria. It was of no use to them if it had no effect on the deeper tissues. In the cases of pyorrhœa in which good results were claimed to have been effected, reinfection occurred. His opinion was that pyorrhœa must be treated surgically or not at all.

Dr. L. Herschel Harris said that he claimed to have been one of the first to use ionic medication in Australia. His attention had been drawn to Lewis Jones's publication on the treatment of rodent ulcer. Lewis Jones had carried out experiments 12 years before, and claimed to have obtained extremely good results in this way. He applied ionic medication in cases of rodent ulcer and of indolent ulcers. The immediate results were quite satisfactory in the former condition and satisfactory in the latter. Specific ulcers also did well, but he had to admit that the patients were taking potassium iodide at the same time. He had also used copper sulphate for ionization in actinomycosis, because it was held that copper sulphate had a special action in this condition. The patients also took pills of copper sulphate. At first the results were quite good. In all these affections he found that the apparently good results were not permanent. He was inclined to think that the beneficial action was due to the current and not to the ions. Eventually he gave up ionic medication in disgust, and he obtained much better results now in other ways.

Professor Vonwiller in his reply, pointed out that systematic experiments should be carried out, if the method was to be employed in practice. A record should be kept of the total amount of current used and of all other particulars. It was only when full information was available that a reliable opinion could be formed. He thanked Mr. Myers for his excellent demonstration. Mr. Myers was an altruist and was anxious to assist the medical profession.

Mr. Myers replied at a late hour. He stated that he was not a doctor, and that many of the questions that had been put to him were questions which only a medical man could answer. Professor Chapman had criticized them for having assumed that ions could penetrate to deeply seated lesions. They had not made any claim of this sort. He admitted that he had not discovered iodine in the urine, but he had obtained a salicylic reaction after ionization. He was of opinion that a certain amount of ionic deposition would take place in the deeper tissues. If Professor Chapman would read their paper carefully, he would see that they had referred more especially to surface effects. Iodine travels faster under the potential gradient than if it were painted on the surface. They frequently painted the skin with iodine to increase the source of the ions. He likened the effect of ionization on an open wound to the process of electro-plating; the whole surface of the cavity was brought under the influence of active ions.

Mr. Myers also dealt with some points in connexion with the application of ionization in dental work, and stated that the results obtained appeared to be better than those obtained by other means. In regard to the choice of electrolyte, he suggested that this was a matter to be determined by medical men. Professor Chapman had referred to his statement that the whole of the potassium iodine had disappeared from the pad. What he had actually noted was that the iodine colour had been completely removed from the solution. He admitted that this might be due in part to the action of the potassium salt. He was convinced that the ions would eventually disappear into the body. In reply to Dr. Herschel Harris, he suggested that the reason for some of the failures was that they had used insufficient currents, or that they had not used the currents long enough. The pain in applying the current through a jelly pad was severe at the start, but the patient soon found that he could tolerate an increased amount. He thanked the members for the manner in which his demonstration had been received.

Dr. A. A. Palmer, the President, said that they had been pleased to be associated with the Electrical Association of Australia and with the Dental Council of New South Wales. They were very indebted to Professor Vonwiller and to

Mr. Myers and Mr. Grant for the great trouble they had taken to give them a highly interesting evening. He asked the members to pass a vote of thanks to the speakers by acclamation.

The following have been elected as members of the New South Wales Branch:—

W. F. S. Yeates, M.B., 1915 (Univ. Sydney), Ballina.

J. A. Gruen, M.B., 1917 (Univ. Sydney), "Kelvin," 77 Ramsay Street, Haberfield.

J. McFadzean Rossell, M.B., 1917 (Univ. Sydney), "Wimilda," Redmyre Road, Strathfield.

W. E. Roberts, L.R.C.P., Lond., M.R.C.S., Eng., 1908, Alexander Flat, Bayswater Road, Darlinghurst.

Naval and Military.

CASUALTIES.

Three lists of casualties sustained by Australian troops have been issued since April 17, 1918. In the 390th list it is announced that Captain Ronald Sydney Andrews has been wounded. In the 391st list there is an entry to the effect that Captain Theophilus George Allen has been wounded. The 392nd list does not contain any names of medical officers of the Army Medical Corps.

APPOINTMENTS.

The following appointments, etc., have been notified in the *Commonwealth of Australia Gazette*, No. 56, of April 18, 1918.

Army Medical Corps.

To be Lieutenant-Colonel (Honorary Colonel)—
Honorary Lieutenant-Colonel A. Honman, Australian Army Medical Corps Reserve. Dated 16th April, 1918.

To be Major—
Captain (temporary Major) W. R. Clay, Australian Imperial Force. Dated 15th April, 1918.

To be Captains—
Lieutenant D. L. Howell, Sydney University Scouts. Dated 20th March, 1918.
Frank Edwin Dawson. Dated 18th March, 1918.
Raymond Arthur Dart and Keith Arnold Stephenson. Dated 25th March, 1918.
John Ralph Donaldson and John McDonald. Dated 3rd April, 1918.
John Joseph Kelly. Dated 5th April, 1918.

Appointments Terminated.

The appointments of the undermentioned officers to be terminated from dates stated opposite names:—
Colonel W. T. Heyward, C.M.G., 6th April, 1918.
Major E. W. Griffiths, 5th April, 1918.
Major H. P. Brownell, D.S.O., 31st March, 1918.
Captain E. V. R. Fooks, 28th March, 1918.
Captain E. L. Morgan, 9th April, 1918.
Captain R. A. Cooper, 28th February, 1918.

Obituary.

GILBERT ABERDEEN HARVEY.

Information has been received in Adelaide that Gilbert Aberdeen Harvey had died of wounds. The details to hand are extremely meagre, but the main facts are eloquent enough. He was serving with the Royal Army Medical Corps in Flanders. A gas attack had been in progress and four men suffering from the effects had been brought in. He had left his dug-out to attend to these men, when a shell exploded near by. He died on the following day of the wounds received. He, like thousands of others, had recognised his duty to his country and had ignored the risk. While we mourn the loss of men like him, we feel intensely proud that the honour of the medical profession has been in his hands.

Gilbert Aberdeen Harvey, who was the son of the late James Harvey, one of Adelaide's leading commercial men, was born in 1886. He was educated at the Queen's School in Adelaide, and at the Medical School of the Adelaide University, where he took the degrees of M.B., B.S. He then served as Resident Medical Officer both at the Adelaide Hospital and at the Children's Hospital. He was a great favourite as a student and as a young graduate, despite his reserved manner, and possessed the high opinion of his contemporaries. He was a fine athlete. After having served his term at the Children's Hospital, he proceeded to England for the purpose of undertaking post-graduate study at various schools. He was in London in August, 1914, and immediately offered his services to the military authority. He obtained a commission in the Royal Army Medical Corps and was continuously on active service up to the time of his death. He had been married for only two months. The greatest sympathy is felt for his widow.

ROBERT DEY.

We regret to announce the death of Robert Dey, which took place on April 10, 1918, at Walgett, New South Wales.

Robert Dey was born at Nairn in Scotland. He was the eldest son of the Reverend Robert Dey, the Editor of *The Australian Christian World*. He came to New South Wales in his early youth, and was educated at the Newington College in Sydney. He studied medicine at the Sydney University and received the degree of Bachelor of Medicine in 1898. His first appointment after graduation was that of Resident Medical Officer at the Coast Hospital, and his second that of Resident Medical Officer at the Royal Prince Alfred Hospital. After serving in various parts of the State as assistant to other medical men, he started practice at Broken Hill. A short time later, he purchased a practice at Wilcannia. In 1904 he again changed his place of residence; he bought a practice at Bourke, where he stayed until 1916. He was elected a medical officer of the Hospital, and soon worked up a very large practice. His kindly personality and his inherent generosity contributed to his wide popularity. In addition to his medical work, he took an active interest in pastoral affairs, and was an ardent Freemason. In 1915 ill-health overtook him, and he recognized that the liver affection from which he was suffering would terminate his life in the course of a relatively short time. He enlisted in the Australian Army Medical Corps Reserve, and was appointed to the Concentration Camp at Holdsworthy with the rank of Captain. In the meanwhile, his practice was being taken care of by a colleague, but eventually he found it advisable to dispose of it. After some time of service in the Army Medical Corps Reserve, his ill-health compelled him to apply for his discharge. He improved somewhat during the early part of 1917, and was able to acquire a practice at Walgett and to work in this practice for a short time. Towards the end of the year a palliative operation became necessary. After the operation he gradually lost ground and, as stated above, died on April 10, 1918. He leaves a widow and two daughters.

THE WESTERN AUSTRALIAN HEALTH BILL.

In our issue of April 13, 1918, we reported that the Premier of Western Australia had taken steps to bring the session to an early close, and that the result of this action had been that the *Health Act Amendment Bill*, which was receiving the attention of the Legislative Assembly, would probably be shelved. We are pleased to note that the House proceeded with the second reading on April 10, and agreed to a second reading without a division. The Committee stage was fixed for April 16. A brief report of the proceedings of the House during the Committee stage will be published in due course.

Books Received.

ENCYCLOPÆDIA MEDICA, Second Edition, under the general editorship of J. W. Ballantyne, M.D., C.M., F.R.C.P.E., VOLUME V., FILIX MAS to HEART. Edinburgh and London: W. Green & Son, Ltd.; 1917. Sydney: Butterworth & Company (Australia), Ltd. Royal 8vo., pp. 766, illustrated. Price, £1.

PAINLESS CHILDBIRTH IN TWILIGHT SLEEP IN THE EAST, by Cecil Webb-Johnson, M.B., Ch.B., Foreword by V. B. Green-Armytage, M.D., M.R.C.P., I.M.S.; 1918. Sydney: Butterworth & Co. (Australia), Ltd. Calcutta: Butterworth & Co. (India), Ltd. London: Butterworth & Co. Demy 8vo., pp. 123.

SERVICE PUBLICATION No. 15: REPORT ON HOSPITAL ACCOMMODATION ON SHIPS, by C. L. Park, M.B., Ch.B., D.P.H., Chief Quarantine Officer (General), Tasmania; 1917. Royal 8vo., pp. 79, with illustrations. Albert J. Mullett, Government Printer, Melbourne.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

The following have been registered, under the provisions of the *Medical Act, 1912 and 1915*, as duly qualified medical practitioners:—

Malone. William Clair Leonard, Lic. R. Coll. Phys., Edin., 1910; Lic. R. Coll. Surg., Edin.; Lic. Fac. Phys. Surg., Glasg., 1910; D.P.H., R.C.P.S., Irel., 1917.

Nesbitt, Mortimer Durnford, M.B., Bac. Surg., 1906, Univ. Melbourne.

VICTORIA.

The undermentioned has been registered, under the provisions of Part I. of the *Medical Act, 1915*, as a duly qualified practitioner:—

William Albert Edward Leary, Federal Coffee Palace, Melbourne, M.B. *et* Ch.B., B.A.O., Dublin, 1893.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes, etc., sought, etc., see "Advertiser," page xv.

Royal Alexandra Hospital for Children, Camperdown, Resident Medical Officer and temporary Honorary Relieving Medical Officer.

Lunacy Department, Victoria, Temporary Medical Officer.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Friendly Society Lodges, Institutes, Medical Dispensaries and other contract practice. Australian Prudential Association Proprietary, Limited. National Provident Association. Life Insurance Company of Australia, Limited. Mutual National Provident Club.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Medical Officers to the Selwyn Hospital, North Queensland. Brisbane United Friendly Society Institute. Cloncurry Hospital.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	The F.S. Medical Assoc., Incorp., Adelaide. Contract Practice, Appointments at Renmark.
WESTERN AUSTRALIA. (Hon. Sec., Health Department, Perth.)	All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Balmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phœnix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Parramatta, Auburn and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wallsend.
TASMANIA. (Hon. Sec., Belsrive, Tasmania.)	Medical Officers in all State-aided Hospitals in Tasmania.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, N.Z.

Diary for the Month.

Apr. 26.—N.S.W. Branch, B.M.A.
May 1.—Vic. Branch, B.M.A.
May 3.—Q. Branch, B.M.A.
May 10.—N.S.W. Branch, B.M.A., Clinical.
May 10.—S. Aust. Branch, B.M.A., Council.
May 14.—Tas. Branch, B.M.A., Council and Branch.
May 14.—N.S.W. Branch, B.M.A., Ethics Committee.
May 15.—W. Aust. Branch, B.M.A.
May 16.—Vic. Branch B.M.A. Council Election of Representatives on Representative Body.
May 16.—Vic. Branch, B.M.A., Council; election of Representative on Representative Body.
May 21.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
May 24.—Q. Branch, B.M.A., Council.
May 28.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this Journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney, New South Wales.